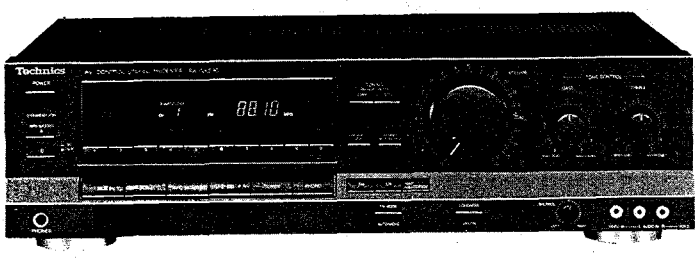
ORDER NO. AD9206177C2

Service Manual

AV Control Stereo Receiver

Receiver

SA-GX230



Colour

(K) ... Black Type
(S) ... Silver Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	(K) (S)

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output	
DIN 1 kHz (T.H.D. 1%)	2×80 W (4 Ω)
40 Hz~20 kHz continuous power output both channels driven	2×50 W (8 Ω)
Total harmonic distortion	
rated power at 40 Hz~20 kHz	0.5% (8 Ω)
half power at 1 kHz	0.03% (8 Ω)
Intermodulation distortion rated power at 60 Hz: 7 kHz=4:1, SMPTE	0.5% (8 Ω)
Power bandwidth both channels driven, −3 dB	10 Hz~40 kHz (8 Ω)
Damping factor	40 (8 Ω)
Input sensitivity and impedance	
PHONO	3 mV/47 kΩ
CD, VCR 1	200 mV/22 kΩ
VCR2, TAPE	200 mV/22 kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
S/N at rated power (8 Ω)	
PHONO	70 dB (IHF, A: 80 dB)
CD, VCR 1	80 dB (IHF, A:90 dB)
VCR 2, TAPE	80 dB (IHF, A:90 dB)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
CD, VCR 1	10 Hz~40 kHz (±3 dB)
VCR 2, TAPE	10 Hz~40 kHz (±3 dB)
Tone controls	
Bass	50 Hz, +10 dB~−10 dB
Treble	20 kHz, +10 dB~−10 dB
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage	
VCR 1 OUT	200 mV
TAPE REC (OUT)	200 mV
Channel balance, 250 Hz~6.3 kHz	±1 dB
Channel separation	55 dB
Headphones output level and impedance	430 mV/330 Ω
Load impedance	
A or B	4 Ω~16 Ω
A and B	8 Ω~16 Ω

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz
Sensitivity	
S/N 30 dB	1.5 μV (75 Ω)
S/N 26 dB	1.3μV (75 Ω)
S/N 20 dB	1.2μV (75 Ω)
IHF usable sensitivity	1.5 μV (IHF'58, 75 Ω)
IHF 46 dB stereo quieting sensitivity	22 μV/75 Ω
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (71 dB, IHF)
Frequency response	20 Hz~15 kHz, +1 dB~−2 dB
Alternate channel selectivity	
±400 kHz	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
Carrier leak	
19 kHz	−55 dB (−60 dB, IHF)
38 kHz	−50 dB (−55 dB, IHF)
Channel balance (250 Hz~6.3 kHz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75 Ω (unbalanced)

Technics

■ AM TUNER SECTION

For (E/EB) areas.	
Frequency range	
MW	522 kHz~1611 kHz (9-kHz steps) 530 kHz~1620 kHz (10-kHz steps)
LW	144 kHz~288 kHz
Sensitivity (S/N 20 dB)	
MW	20 µV, 330 µV/m
LW	45 µV
Selectivity (±9 kHz)	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 252 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
For (EG) area.	
Frequency range	522 kHz~1611 kHz (9-kHz-Schritte) 530 kHz~1620 kHz (10-kHz-Schritte)
Selectivity (S/N 20 dB)	20 µV, 330 µV/m
Selectivity at 999 kHz	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ GENERAL

Power consumption	260 W
Power supply	
For (E, EB) areas.	AC 50 Hz/60 Hz, 230 V/240 V
For (EG) area.	AC 50 Hz/60 Hz, 230 V
Dimensions (W × H × D)	430 × 125 × 305 mm
Weight	7 kg

■ REMOTE CONTROL TRANSMITTER

Control keys	32 keys
Dimensions (W × H × D)	70 × 27 × 175 mm
Weight (including batteris)	125 g
Power source	Two UM-4 (Panasonic R03/LR03 or equivalent)

Notes:

1. Specifications are subject to cahnge without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer.

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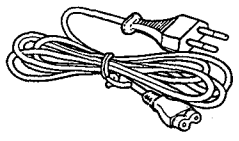
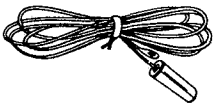
■ ACCESSORIES

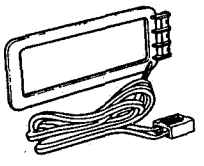
- AC power supply cord... 1 pc.
  [RJA0019-1K (E, EG)
  L SJA193 (EB)]



- FM indoor antenna (RSA0007) ..... 1 pc.



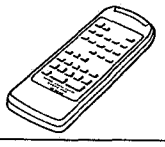
- AM loop antenna (SPB1163T) ..... 1 pc.



- AM anntena holder (SMA231M) ..... 1 pc.

- Screws (XTN3+10AFZ)..... 2 pcs.

- Remote-control transmitter (RAK-SA302E)..... 1 pc.



- Batteries (UM-4/R03) ..... 2 pcs. for Remote control unit

- Attachment plug (SJP9009): (EB) only .... 1 pc.

■ BEFORE USE

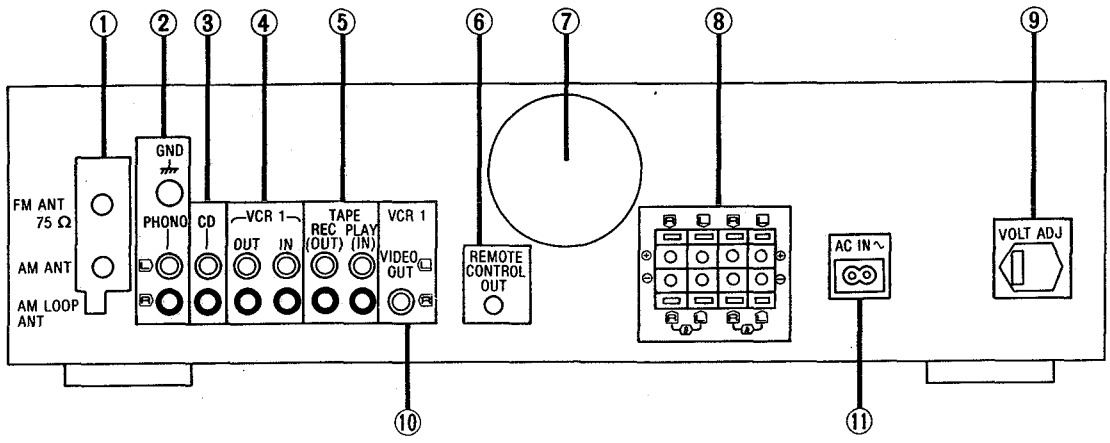
Be sure to disconnect the mains cord before adjusting the voltage selector.
Use a flat-tip (−) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

Note that this unit will be seriously damaged if this setting is not made correctly.

■ REAR PANEL TERMINALS AND FUNCTIONS

Caution:
Do not place books, etc., on top of this unit so that the heat radiation vents remain unblocked.

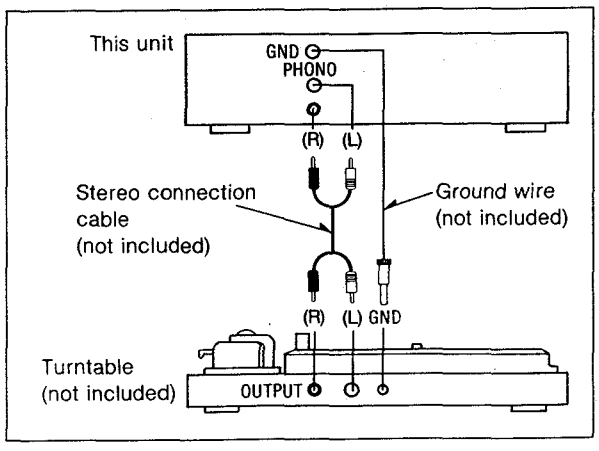
Stereo connection cable
(not included)
White (L)
Red (R)



① Antenna connection terminals

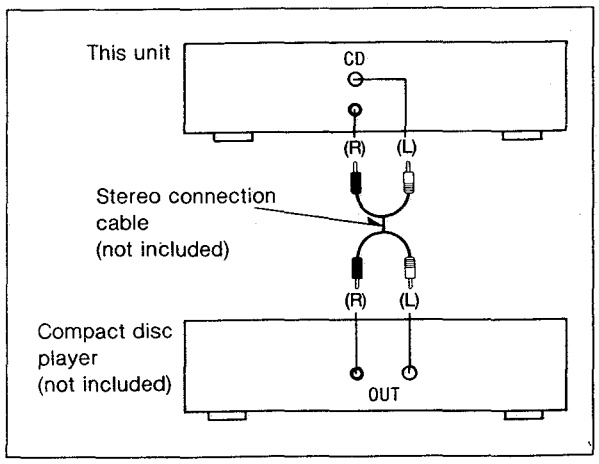
② "PHONO" terminals

Connect a turntable only. Do not connect any other sound source to these terminals.



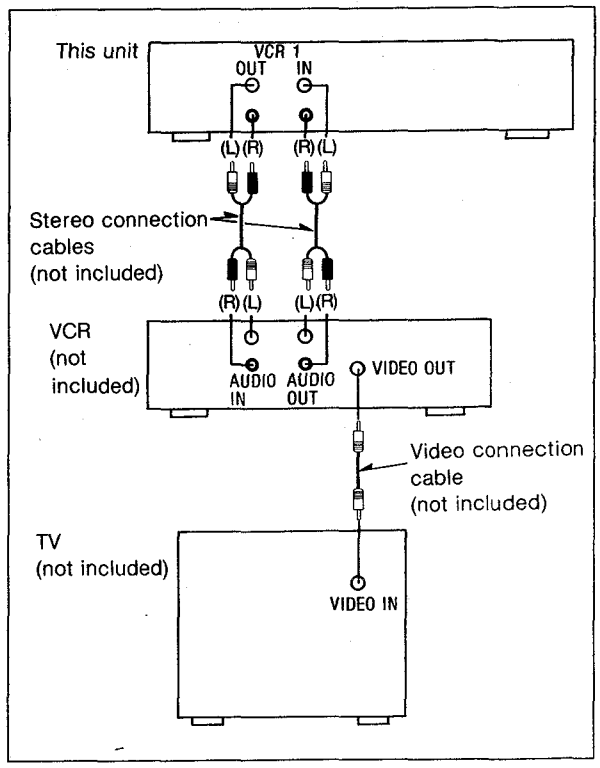
③ "CD" terminals

Connect a compact disc player.



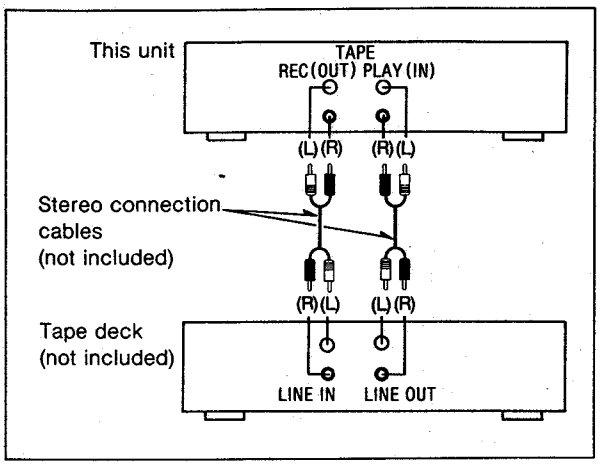
④ "VCR 1" terminals

Connect a VCR.
(See the operating instructions of the VCR.)



⑤ "TAPE" terminals

Connect a tape deck.

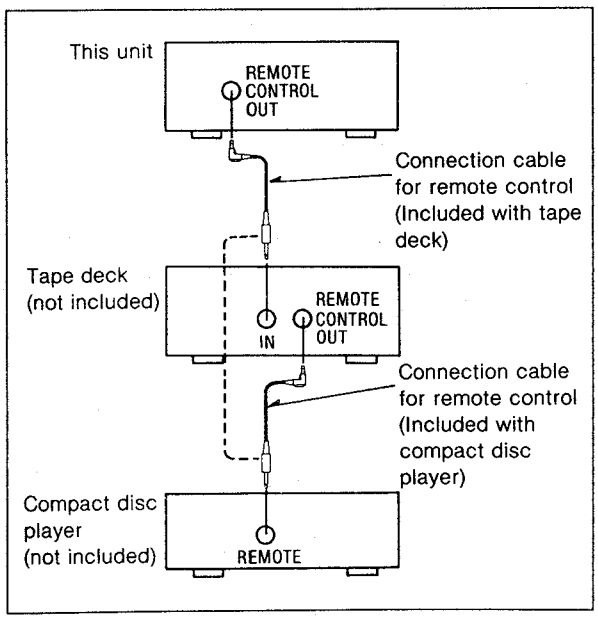


⑥ Remote control OUT terminal (REMOTE CONTROL OUT)

This terminal can be used only with Technics components which have the appropriate remote control terminal. (Consult your dealer for details.)
Proper connection with remote control connection cables SJP2257T will allow control of some functions from this unit's remote control transmitter. (See pages 7–8 for details.)

Connect to a tape deck and/or compact disc player as shown below.

If a tape deck is not being used, the compact disc player can be connected directly (dotted line).


This unit
REMOTE CONTROL OUT
Connection cable for remote control (Included with tape deck)
Tape deck (not included)
IN
REMOTE CONTROL OUT
Connection cable for remote control (Included with compact disc player)
Compact disc player (not included)
REMOTE

Note:
For a compact disc player with a remote control sensor the above connection is not necessary.

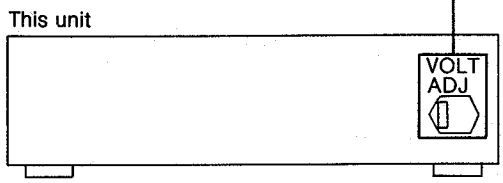
⑦ Cooling fan

The cooling fan operates at high output power levels only.

⑧ Speaker connection terminals

⑨ Voltage selector(VOLT ADJ): for (E, EB) areas

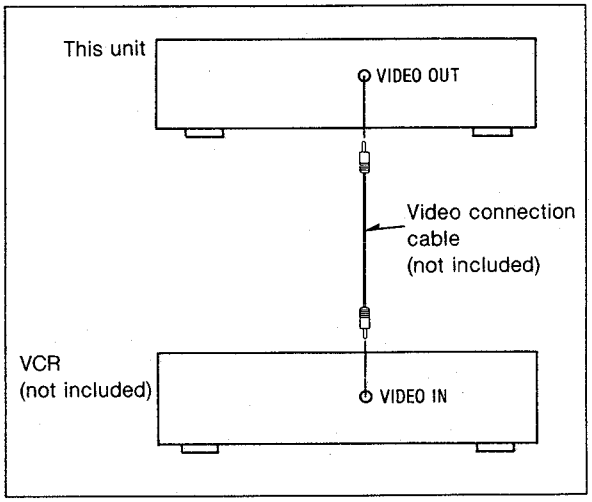
Set the voltage selector to the voltage setting for the area in which the unit will be used.
[Use a minus (–) screwdriver]



Note:
Note that this unit will be seriously damaged if this setting is not made correctly.

⑩ "VIDEO OUT" terminal

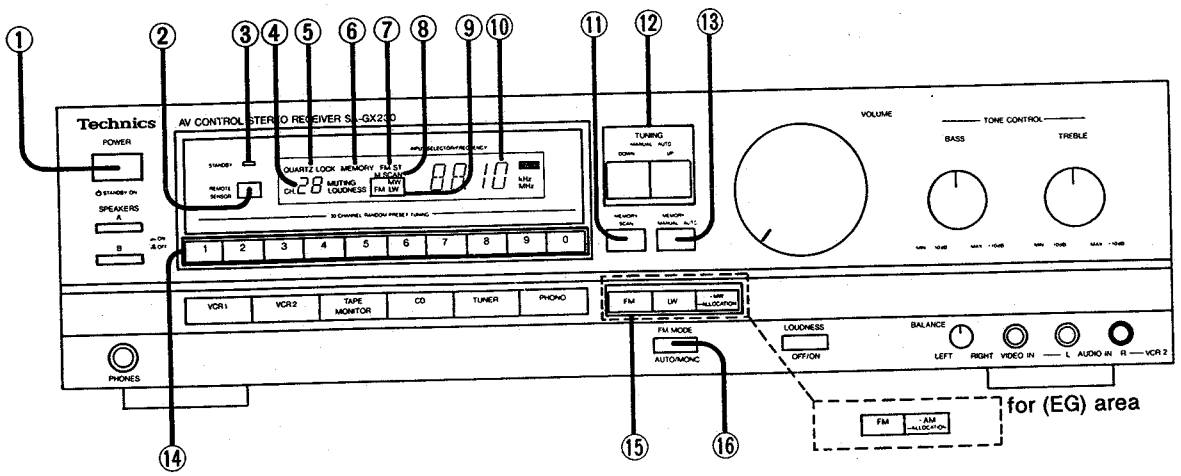
Connect a video connection cable (not included) to the video input terminal of the VCR connected to the "VCR 1" terminals.
When this connection is made, tape-to-tape recording (audio and video) can be carried out simply by connecting a video camera or second VCR (for playback) to the "VCR 2" terminals of this unit.



⑪ AC IN socket (AC IN)

■ FRONT PANEL CONTROLS AND FUNCTIONS

Tuner section



① Power " ⏻ STANDBY/ON" switch (POWER, ⏻ STANDBY/ON)

This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the ⏻ STANDBY position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

② Remote control signal receptor (REMOTE SENSOR)

Receives the signals from the remote control.

③ "STANDBY" indicator (STANDBY)

This indicator illuminates when the "STANDBY" mode is set by the main unit or the remote control transmitter.

④ Channel display

This display shows the channel number selected by one of the preset-tuning buttons.
Also this display shows the channel number for about 3 seconds during memory scan operation.

⑤ Quartz-lock indicator (QUARTZ LOCK)

This indicator illuminates when the unit is tuned precisely to a broadcast station.

⑥ Memory indicator (MEMORY)

This indicator illuminates when the memory button is pressed.

⑦ FM stereo indicator (FM ST)

This indicator automatically illuminates when an FM stereo broadcast is being received.
Note:
It will not illuminate if the FM mode selector is set to the monaural mode.

⑧ Memory scan indicator (M. SCAN)

This indicator illuminates when the memory scan button is pressed.

⑨ Band indicators (FM, LW, MW): for (E, EB) areas (FM, AM) : for (EG) area

Indicates the selected band.

⑩ Input selector/frequency display (INPUT SELECTOR/FREQUENCY)

Displays the selected source or broadcast frequency.

⑪ Memory scan button (MEMORY SCAN)

This button is used to locate a desired broadcast station; each broadcast station is selected for about 3 seconds.

⑫ Tuning buttons (TUNING)

These buttons are used for tuning to the desired broadcast station.

⑬ Memory button (MEMORY)

This button is used when presetting broadcast station frequencies into memory.

⑭ Preset-tuning buttons (1−0) (30 CHANNEL RANDOM PRESET TUNING)

These buttons are used to preset broadcast frequencies into the memory of this unit and to recall the desired preset stations.

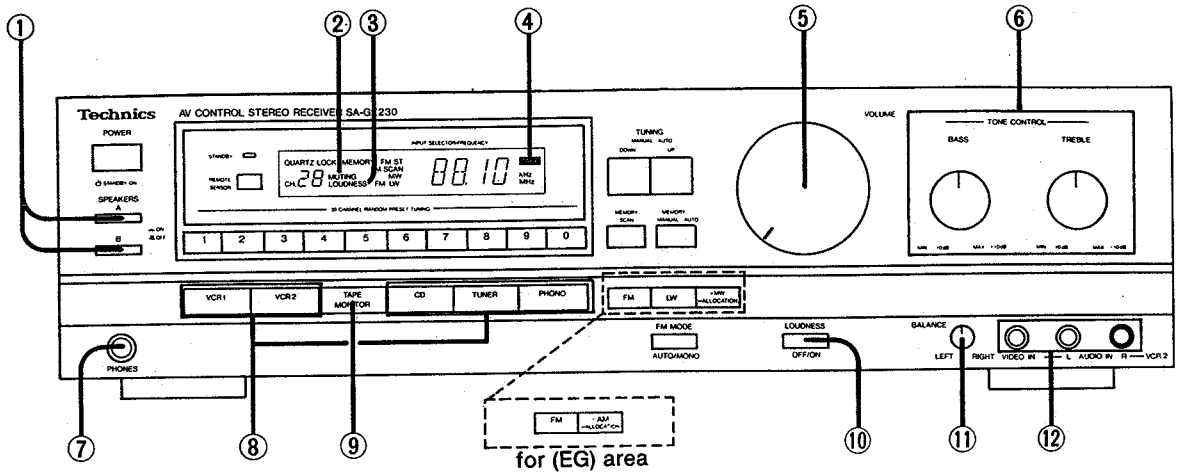
⑮ Band selectors (FM, LW, MW): for (E, EB) areas (FM, AM) : for (EG) area

FM: Press this button to listen to an FM broadcast.
LW: Press this button to listen to an LW broadcast.
MW (E, EB)/AM (EG): Press this button to listen to an MW/AM broadcast.
ALLOCATION: When the MW/AM button is pressed for about 3 seconds, the MW frequency step will change to 10 kHz per set. (This step is set to 9 kHz before shipment.) In order to return to the original frequency indication, press this button for about 3 seconds again.

⑯ FM mode selector (FM MODE)

This unit automatically switches to the stereo mode when an FM stereo broadcast is received. This selector is used to select the mode (stereo or monaural) of FM broadcast signals.

Amplifier section



① Speaker selectors (SPEAKERS)

These selectors are used to select the speaker system(s) (A and/or B).

② Muting indicator (MUTING)

This indicator will illuminate when the muting button (on the remote control transmitter) is pressed.

③ Loudness indicator (LOUDNESS)

This indicator will illuminate when the loudness button is pressed.

④ Tape indicator (TAPE)

This indicator will illuminate when the tape-monitor button is pressed.

⑤ Volume control (VOLUME)

⑥ Tone controls (BASS, TREBLE)

The bass control is used to adjust the low-frequency sound range, and the treble control is used to adjust the high-frequency sound range.

⑦ Headphones jack (PHONES)

⑧ Input selector buttons

These buttons are used to select the sound source to be heard, such as a disc, radio broadcasts, etc. The selected sound source is shown on the input selector/frequency display.
The "PHONO" input selector has two functions: when pressed momentarily it selects "PHONO". When pressed and held for about 4 seconds, it de-activates the muting function.

⑨ Tape-monitor button (TAPE MONITOR)

Press this button to listen to a tape.
To listen to some other source, press this button once again (so that the indicator is switched OFF).

⑩ Loudness button (LOUDNESS)

Set to the "ON" position (the loudness indicator will illuminate); when listening to music at low volume. Auditory perception of sound in the low frequency range falls off at low volume, but when the switch is in this position, this deficiency is compensated for, so that the full impact of tha musical performance can be enjoyed.

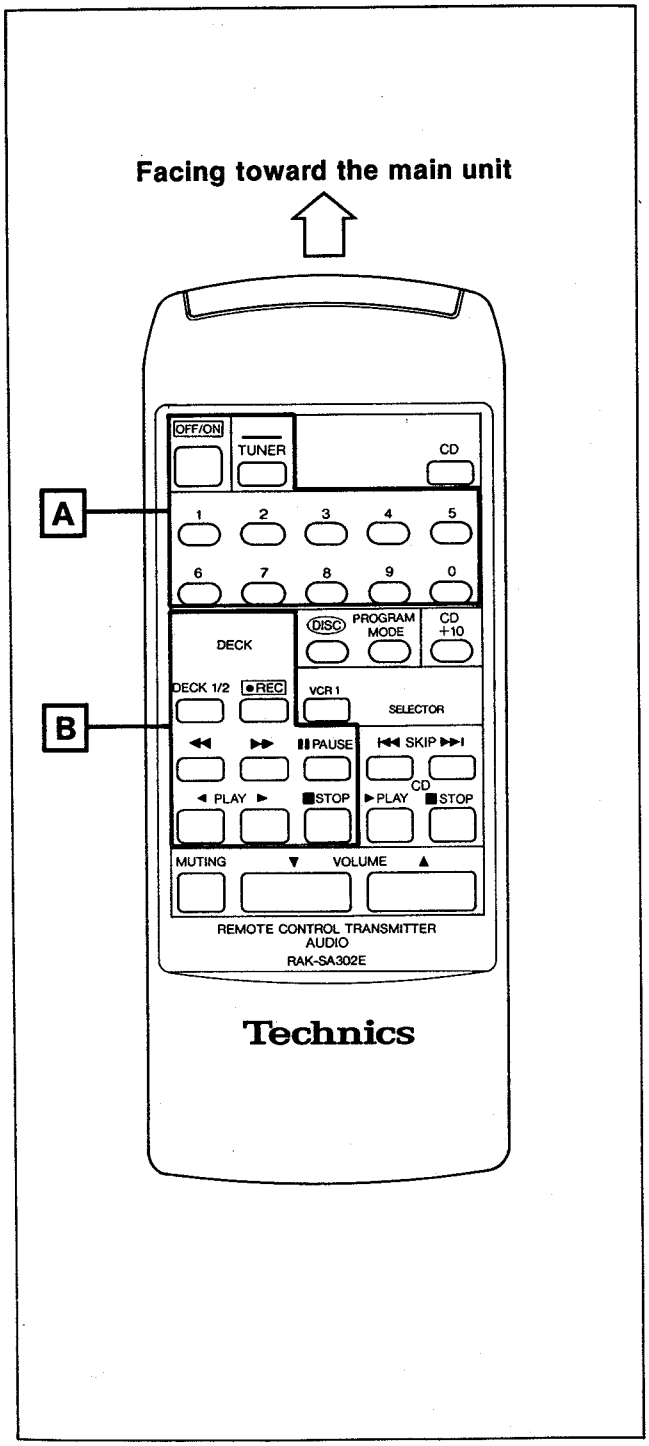
⑪ Balance control (BALANCE)

⑫ "VCR 2" terminals (VCR 2)

These terminals are used for tape-to-tape recording if a second VCR is connected here.

■ REMOTE CONTROL OPERATION

- This remote control transmitter can be used for control of a Technics cassette tape deck or a compact disc player with a remote control terminal.
  Consult your dealer for details.
- For detailed information concerning operation steps, etc., please refer to the appropriate page for each unit and the respective operating instructions.
- For this system, you can listen to tapes or compact discs, etc., by operating the remote control transmitter without using this unit's input selectors.
- Make sure that the power of each unit is set to the "ON" position, before beginning the operations.



A Tuner controls

TUNER
Press this button first to use the "OFF/ON" button or the 1 – 0 buttons.

OFF/ON
This button can be used for ON and OFF switching of this unit.
When switching the power ON and OFF, be sure to first press the "TUNER" button.

1 – 0
Press these buttons to select the desired preset channel.
When these buttons are used, be sure to first press the "TUNER" button.

To designate channels 1–9:
Press the appropriate (1–9) preset-tuning button.
Note: When selecting channel 1, 2 or 3 enter the selection "01", "02" or "03". If only "1", "2" or "3" is pressed, channel access will be delayed by two seconds.

To designate channels 10–30:
① Press the button for the "tens" digit (1, 2 or 3).
② Press the button for the "units" digit (1–0) within 2 seconds after pressing the first button.

Note:
If the interval between pressing the first button and pressing the second button is more than about 2 seconds, the setting may not be made correctly. If this happens, make the setting once again.

B Tape deck controls

DECK 1/2
Press this button to select the deck ("DECK 1" or "DECK 2") to be controlled.

● REC
Press this button to change to the recording stand-by mode.

◀◀ , ▶▶
Press one of these buttons to advance or rewind the tape while the unit is in the stop mode.
Press one of these buttons to select the desired tune while the unit is in the play mode. (Only applicable to a Technics tape deck with the "music select" functions.)

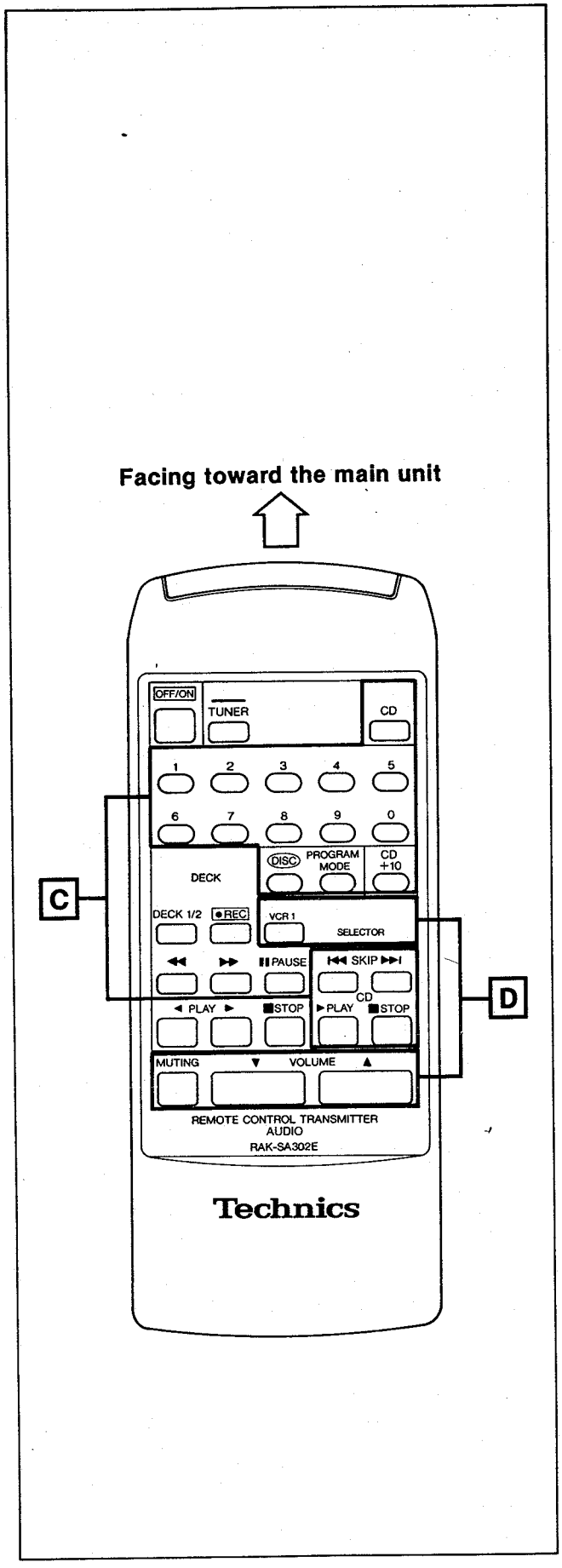
II PAUSE
Press this button to temporarily stop playback or recording.
Press the playback button to resume the playback or recording.

◀ PLAY ▶
Press one of these buttons to begin playback or recording, pressing the button corresponding to the side of the tape to be played back (or recorded).
▶ : For the "forward (A)" side of the tape
◀ : For the "reverse (B)" side of the tape

Note:
Depending on which Technics tape deck is used in combination with this unit, tape deck 1 might be the "A"-side playback-only type.

■ STOP
Press this button to stop tape movement.

Note
Depending on which Technics tape deck is used in combination with this unit, the pause of the playback (and the recording), and the recording functions of tape deck 1 might not be possible by using the remote control transmitter.



C Compact disc player controls

CD
Press this button first to use the 1 – +10 buttons.

1 – +10
Press these buttons to select the desired track.
Playback begins from the track selected.
When these buttons are used, be sure to first press the "CD" button.
Tracks 1–9:
Press the appropriate numeric button 1 – 9 directly.
To select a two-digit track number over 10:
Press the +10 button the necessary number of time to select the "tens" digit, and then one of the 1 – 0 buttons to select the "units" digit.

DISC
If a Technics multi compact disc player is used in combination with this unit, the disc to be played can be selected by first pressing this button and then pressing the appropriate numeric button (1 – 5).

PROGRAM MODE
Press this button to select the desired play mode.
("PROGRAM" or "CONTINUE")

◀◀ SKIP ▶▶
Press one of these buttons briefly to move the pick-up to the beginning of a specific track.

▶ PLAY
Press this button to start play.

■ STOP
Press this button to stop play.

Note:
When operating a compact disc player with a remote control sensor, face this remote control transmitter toward the remote control sensor of the compact disc player.

D Amplifier controls

VCR 1
Press this button to select the "VCR 1" input selector on the main unit.

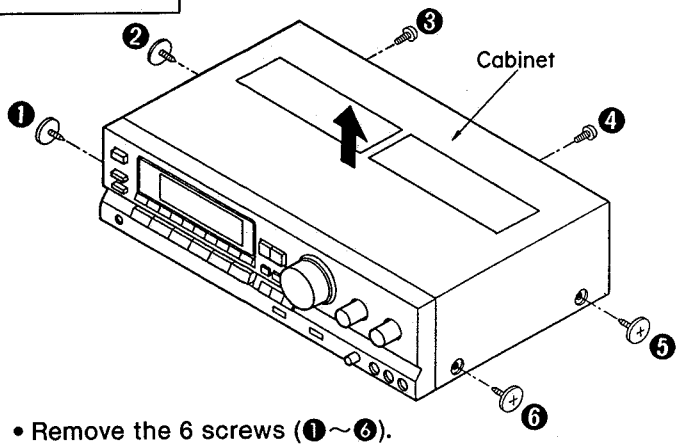
MUTING
Press this button to temporarily reduce the volume level.
The volume level is attenuated by 20 dB (approx. 1/10).
Press once again to return to the previous volume level.

▼ VOLUME ▲
Press one of these buttons to adjust the volume level.

■ DISASSEMBLY INSTRUCTIONS

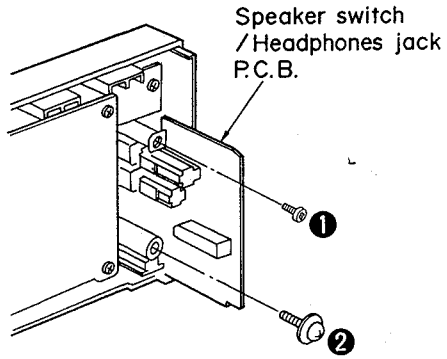
"ATTENTION SERVICER"
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref. No. 1	Removal of the cabinet
Procedure 1	



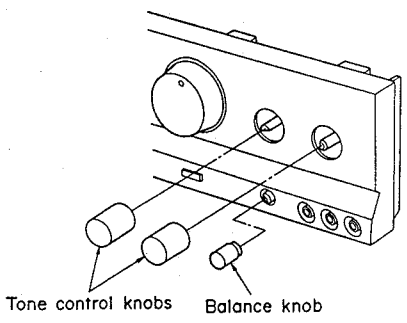
• Remove the 6 screws (❶~❻).

Ref. No. 3	Removal of the speaker switch/headphones jack P.C.B.
Procedure 1→2→3	

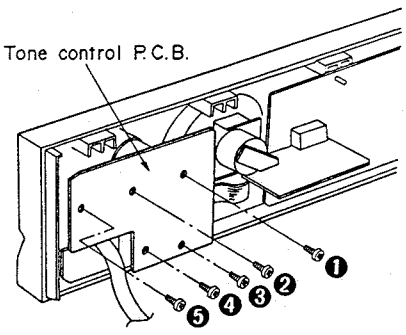


• Remove the 2 screws (❶, ❷).

Ref. No. 4	Removal of the tone control P.C.B.
Procedure 1→2→4	

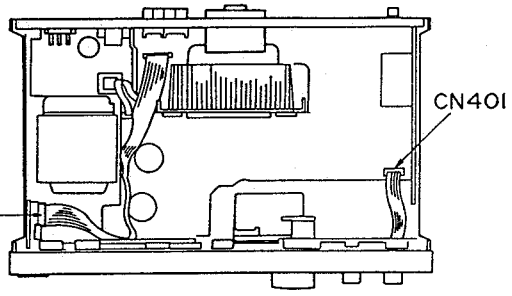


1. Remove the 2 tone control knobs and a balance knob.

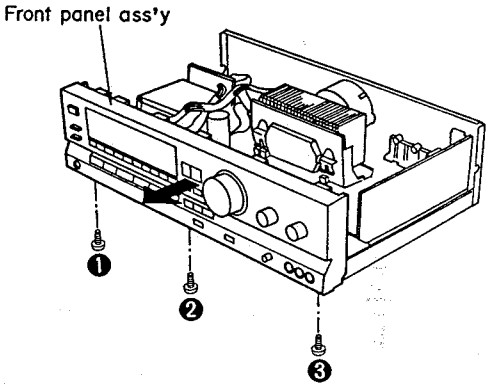


2. Remove the 5 screws (❶~❺).

Ref. No. 2	Removal of the front panel ass'y
Procedure 1→2	



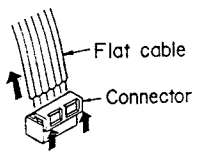
1. Remove the 2 flat cables (CN401, CN601).



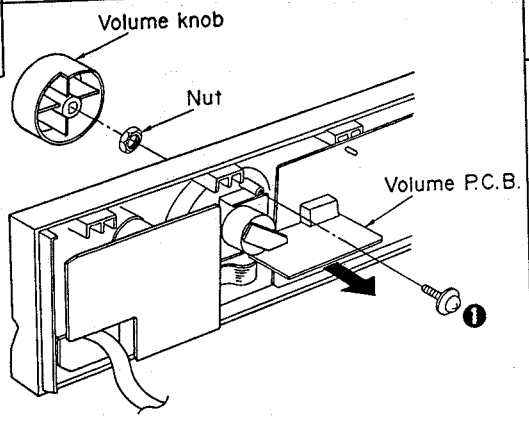
2. Remove the 3 screws (❶~❸).
3. Remove the front panel ass'y in the direction of arrow.

How to remove the flat cable

1. Lift up the connector.
2. Pull out the flat cable.

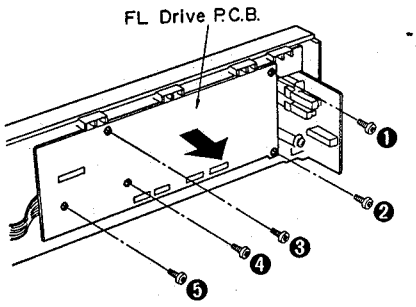


Ref. No. 5	Removal of the volume P.C.B.
Procedure 1→2→5	



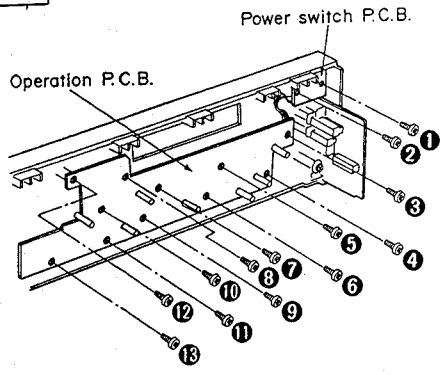
1. Pull out the volume knob.
2. Remove the nut.
3. Remove the 1 screw (❶).
4. Remove the volume P.C.B. in the direction of arrow.

Ref. No. 6	Removal of the FL drive P.C.B.
Procedure 1→2→5→6	



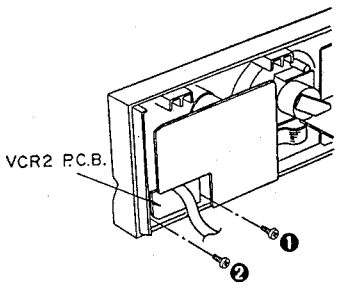
1. Remove the 5 screws (❶~❺).
2. Remove the FL drive P.C.B. in the direction of arrow.

Ref. No. 7	Removal of the power switch P.C.B. and Operation P.C.B.
Procedure 1→2→5→6→7	



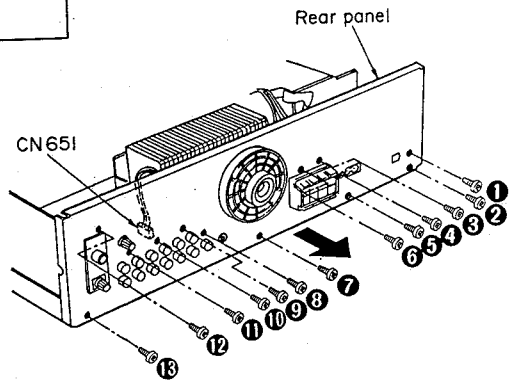
• Remove the 13 screws (❶~⓭).

Ref. No. 8	Removal of the VCR2 P.C.B.
Procedure 1→2→8	



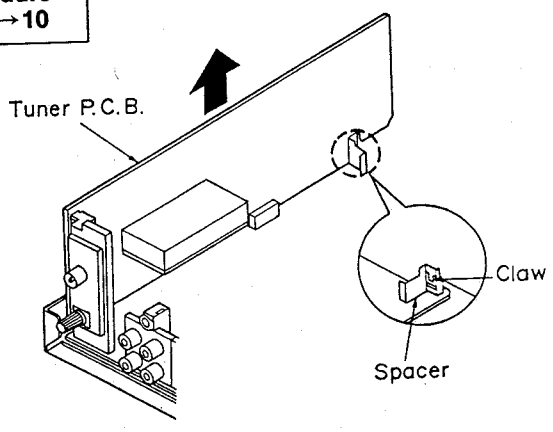
• Remove the 2 screws (❶, ❷).

Ref. No. 9	Removal of the rear panel
Procedure 1→9	



1. Remove the 13 screws (❶~⓭).
2. Remove the 1 connector (CN651).
3. Remove the rear panel in the direction of arrow.

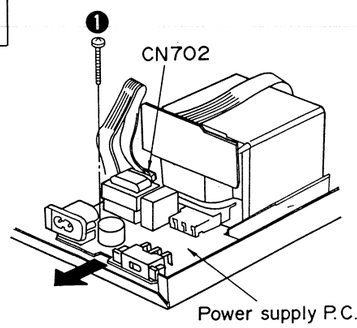
Ref. No. 10	Removal of the tuner P.C.B.
Procedure 1→9→10	



1. Release the 1 claw.
2. Remove the tuner P.C.B. in the direction of arrow.

Ref. No. 11 — Removal of the power supply P.C.B.

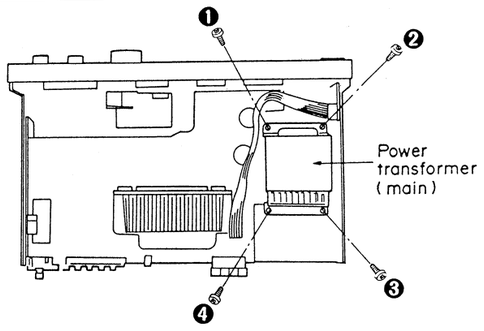
Procedure 1→9→11



1. Remove the 1 screw (❶).
2. Remove the 1 flat cable (CN702).
3. Remove the power supply P.C.B. in the direction of arrow.

Ref. No. 12 — Removal of the power transformer (main)

Procedure 1→9→11→12

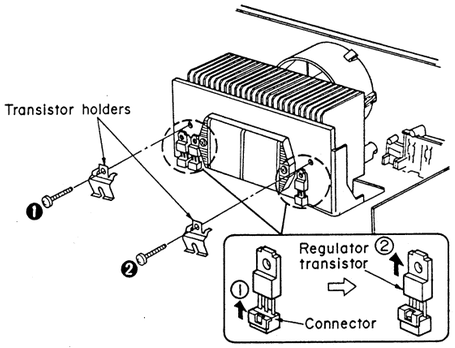


• Remove the 4 screws (❶~❹).

Ref. No. 13 — Removal of the regulator transistor

Procedure 1→2→13

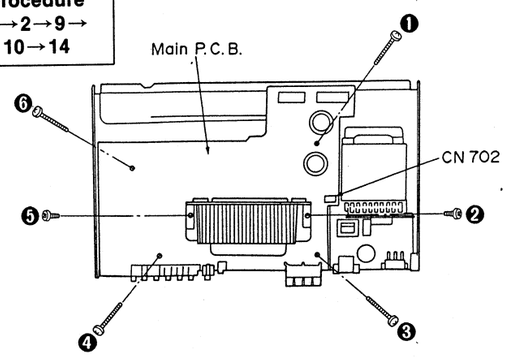
1. Remove the 2 screws (❶, ❷).
2. Remove the 2 transistor holders.
3. Lift up the connector in the direction of arrow ①.
4. Remove the regulator transistor in the direction of arrow ②.



• **When mounting the regulator transistor.**
Apply silicone thermal compound (RFKX0002 or equivalent) to the rear of the regulator transistor.

Ref. No. 14 — Removal of the main P.C.B.

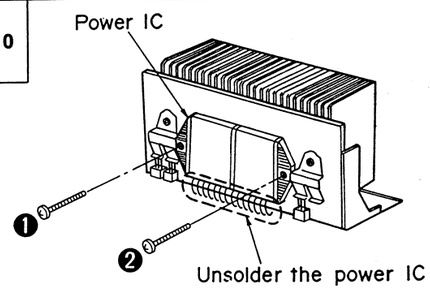
Procedure 1→2→9→10→14



1. Remove the 1 flat cable (CN702).
2. Remove the 6 screws (❶~❻).

Ref. No. 15 — Removal of the power IC

Procedure 1→2→9→10→14→15



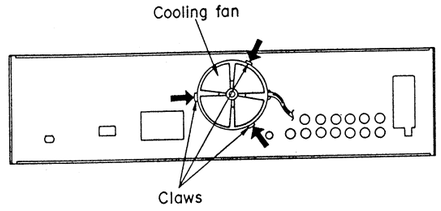
1. Remove the 2 screws (❶, ❷).
2. Unsolder the power IC.

• **When mounting the power IC.**
Apply silicone thermal compound (RFKX0002 or equivalent) to the rear of the power IC.

Ref. No. 16 — Removal of the cooling fan motor

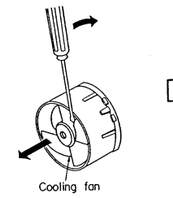
Procedure 1→9→16

1. Release the 3 claws in the direction of arrow and remove the fan motor. (Refer to Fig. 1)
2. Insert a screwdriver at the root of the cooling fan. Force it out of the motor shaft. (Refer to Fig. 2)

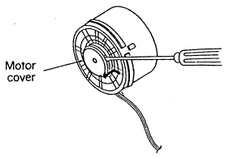


(Fig. 1)

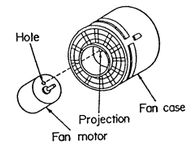
3. Remove the motor cover by used ⊖ screwdriver. (Refer to Fig. 3)
4. Remove the motor from the fancasing. (Refer to Fig. 4)
5. When mounting the motor fan, align the fan casing's projection with the hole of the fan motor.



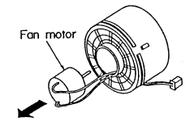
(Fig. 2)



(Fig. 3)



(Fig. 5)

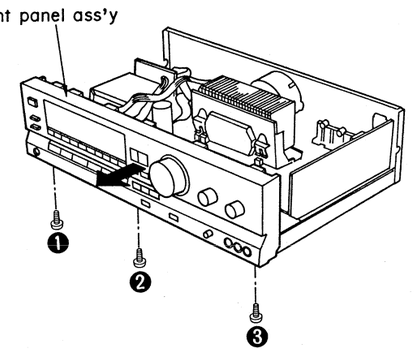


(Fig. 4)

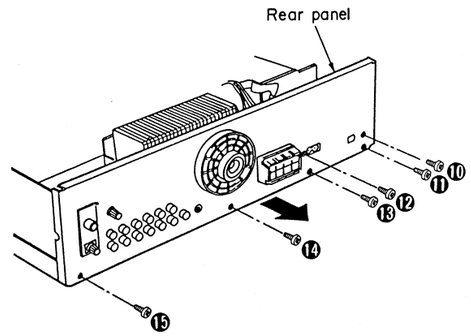
Ref. No. 17 — Check of the main P.C.B.

Procedure 1→17

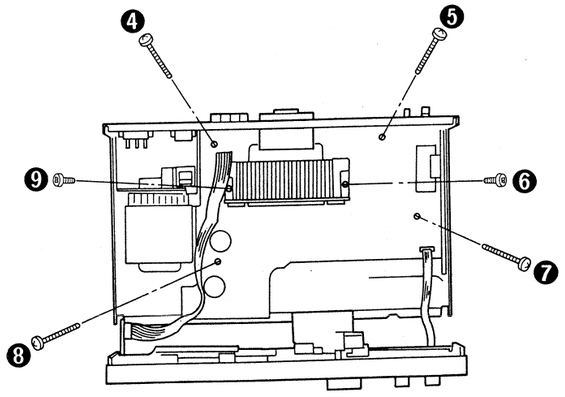
• When checking the soldered surfaces of main P.C.B. and replacing the parts, do as show.



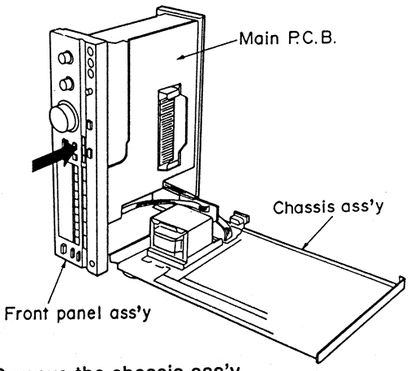
1. Remove the 3 screws (❶~❸).



3. Remove the 6 screws (❿~⓯).
4. Remove the rear panel in the direction of arrow.



2. Remove the 6 screws (❹~❾).



5. Remove the chassis ass'y.
6. Reinstall the front panel ass'y to the main P.C.B.

■ ME

Note: For So,

• **FM AD**

Control
- • FM s
- • Disto
- • DC e

FM MOI
1. Test e
2. Set th
3. Set th to **100**
4. Adjust mode
5. Adjust minim
6. Repea
7. Make are ne

Note:
The a resin.

FM MPX
1. Test e
2. Set the
3. Set the to **100.**
4. Adjust counte

★ USINC
1. Apply stereo
2. Adjust Cemen

• **Adjustm**
Please re

ansformer

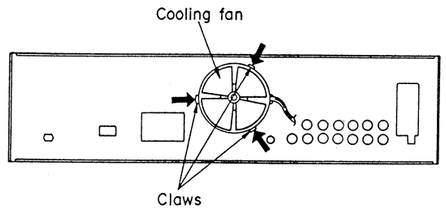
Power transformer (main)

ne power IC

FKX0002 or

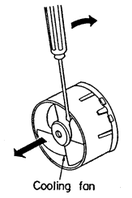
Ref. No. 16	Removal of the cooling fan motor
Procedure 1→9→16	

1. Release the 3 claws in the direction of arrow and remove the fan motor. (Refer to Fig. 1)
2. Insert a screwdriver at the root of the cooling fan. Force it out of the motor shaft. (Refer to Fig. 2)

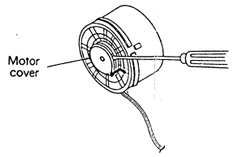


(Fig. 1)

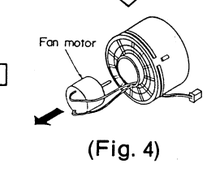
3. Remove the motor cover by used ⊖ screwdriver. (Refer to Fig. 3)
4. Remove the motor from the fancasing. (Refer to Fig. 4)
5. When mounting the motor fan, align the fan casing's projection with the hole of the fan motor.



(Fig. 2)



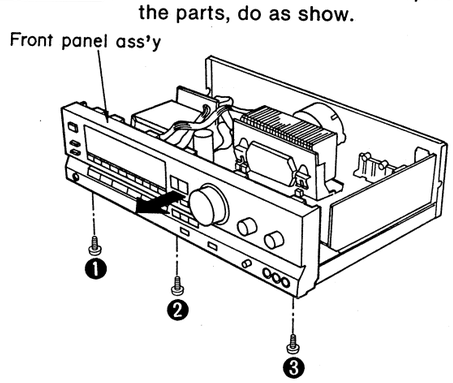
(Fig. 3)



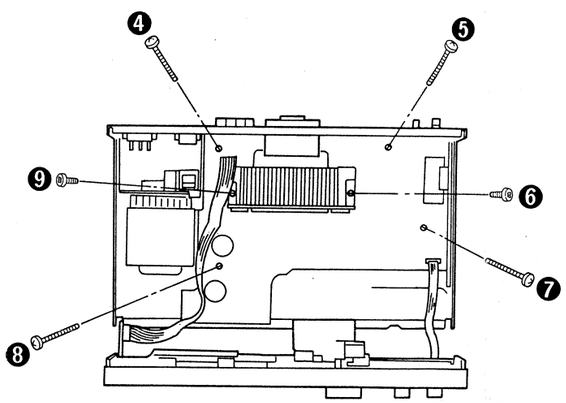
(Fig. 5)

(Fig. 4)

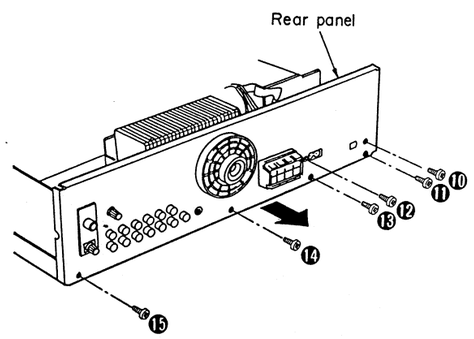
Ref. No. 17	Check of the main P.C.B.
Procedure 1→17	• When checking the soldered surfaces of main P.C.B. and replacing the parts, do as show.



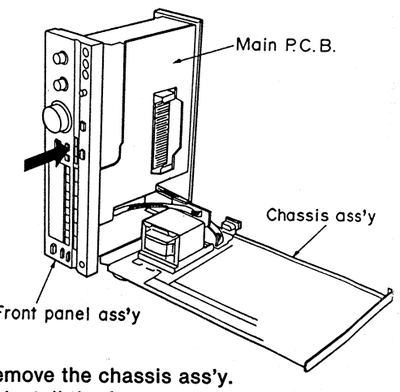
1. Remove the 3 screws (❶~❸).



2. Remove the 6 screws (❹~❾).



3. Remove the 6 screws (❿~⓯).
4. Remove the rear panel in the direction of arrow.



5. Remove the chassis ass'y.
6. Reinstall the front panel ass'y to the main P.C.B.

■ MEASUREMENTS AND ADJUSTMENTS

Note: For Z201/Z251 (AM (MW/LW) ANT and OSC coil), Z202 (AM (MW/LW)-IFT), they are supplied as adjusted parts. So, do not turn the cores of the parts. It is not necessary to adjust the AM (MW/LW) circuit.

• FM ADJUSTMENT

Control positions and equipment used

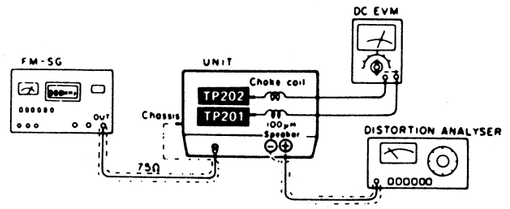
- FM signal generator (FM-SG).
- Distortion analyser
- DC electronic voltmeter (DC EVM)
- Frequency counter
- Choke coil (100μH)
- Resistor (100kΩ)

FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" position.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust **T201** core so that voltage measured in signal mode is **0mV** (0±20mV) in **300mV** range.
5. Adjust **T202** so that the distortion factor of Lch is minimized.
6. Repeat step 4 and 5 a few times.
7. Make sure that the distortion factors of Lch and Rch are nearly the same with each other to minimum.

Note:
The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation.....100%
Modulation frequency.....1kHz (MONO)
Output level.....66dB



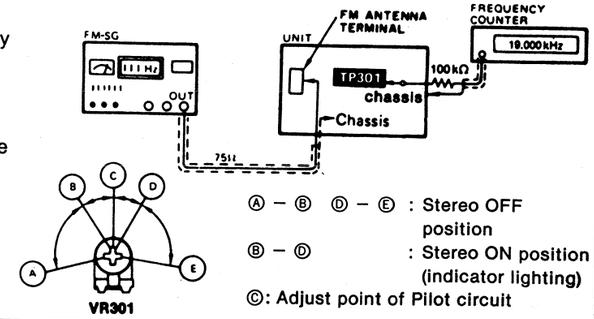
FM MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM auto**" position.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust **VR301** for **19.00±0.03kHz** on frequency counter reading.

★ USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust **VR301** until stereo indicator lights up. Cement arm of **VR301** as shown in figure.

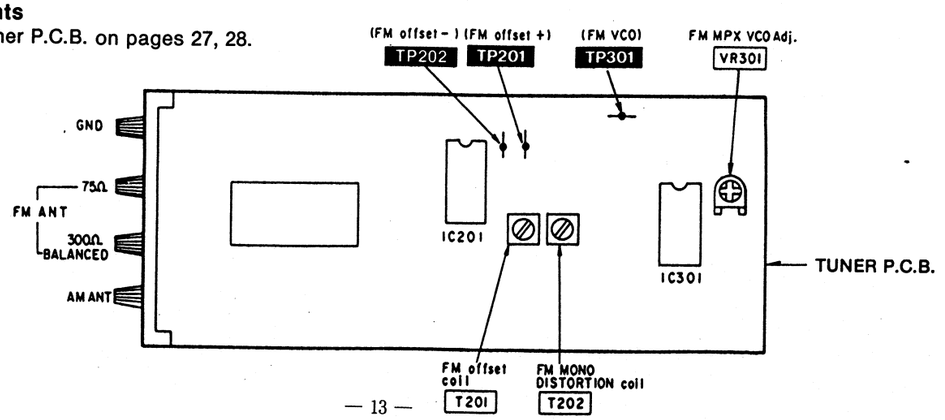
FM SIGNAL GENERATOR CONDITION
Modulation.....0%
(non-modulation)
Output level.....66dB



Ⓐ – Ⓑ Ⓓ – Ⓔ : Stereo OFF position
Ⓑ – Ⓓ : Stereo ON position (indicator lighting)
Ⓒ: Adjust point of Pilot circuit

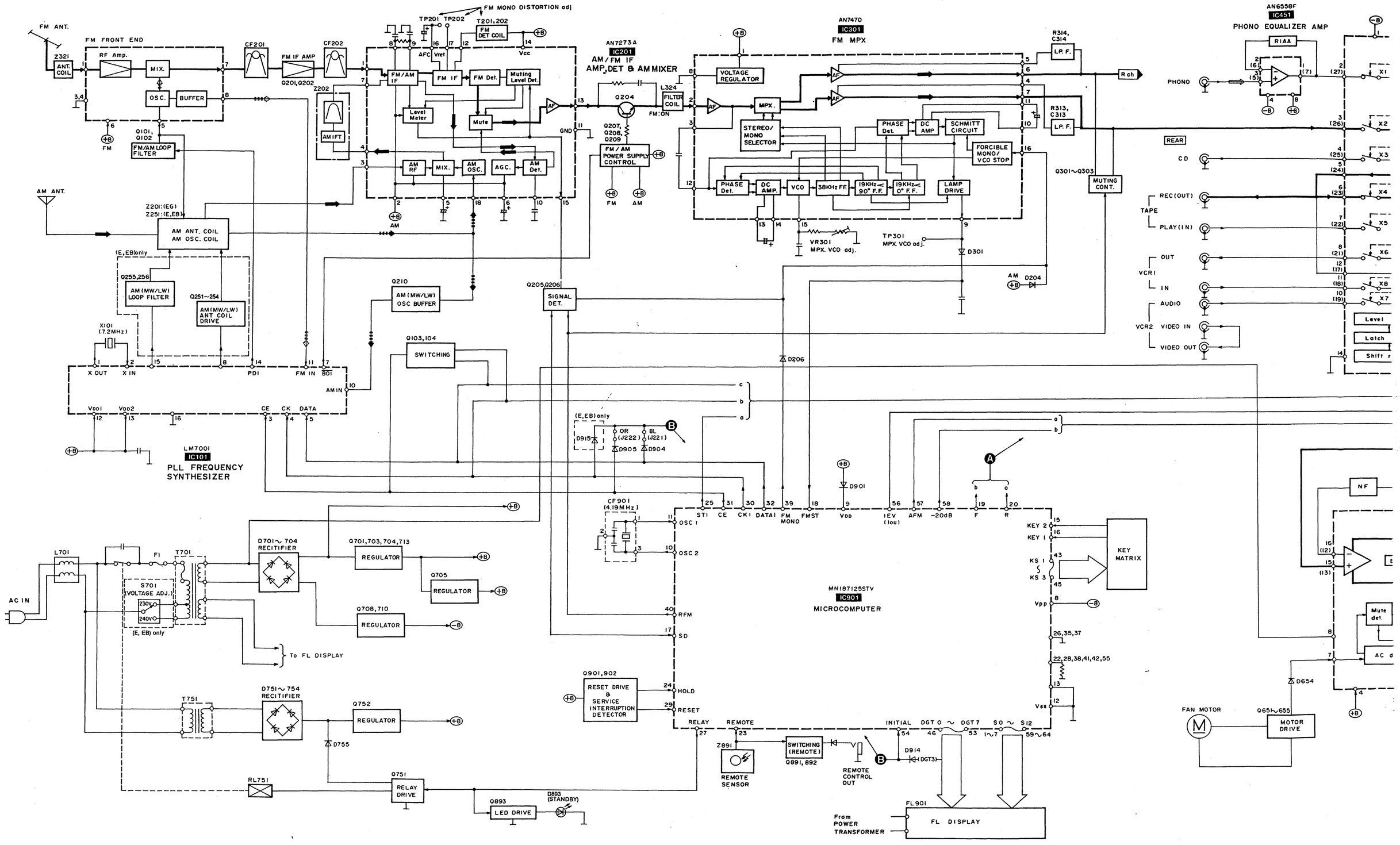
• Adjustment points

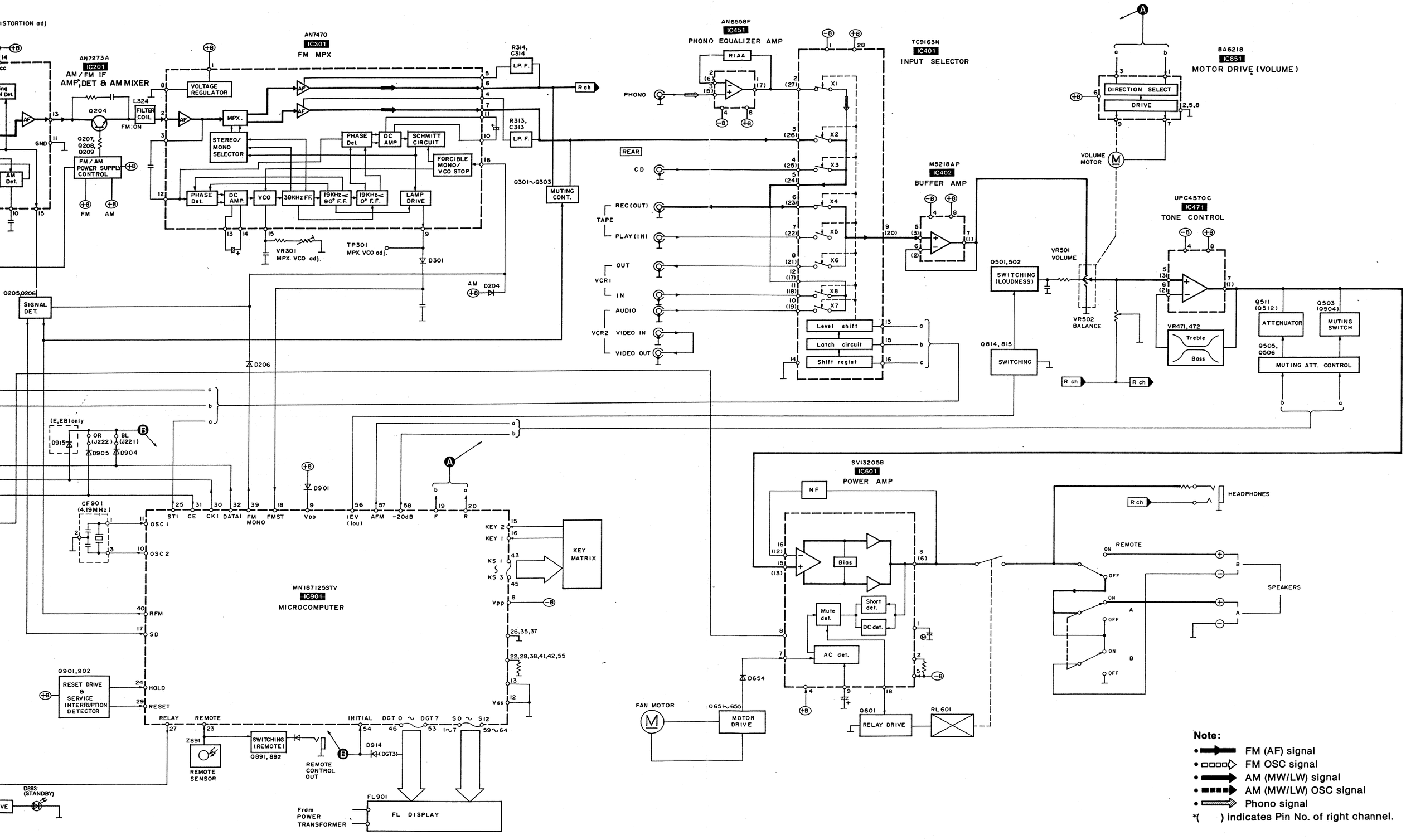
Please refer to tuner P.C.B. on pages 27, 28.



SA-GX230 SA-GX230

■ BLOCK DIAGRAM





Note:

- FM (AF) signal
- FM OSC signal
- AM (MW/LW) signal
- AM (MW/LW) OSC signal
- Phono signal

*( ) indicates Pin No. of right channel.

■SCHEMATIC DIAGRAM (This schematic diagram may be modified at any time with the development of new technology.)

(Parts list on pages 40~44.)

Note 1:

- S601 : Speaker selectors (SPEAKERS) switches. [S601-1: A, S601-2: B]
- S701 : Voltage selector (VOLT ADJ) switch. For (E, EB) areas.
- S901~910 : Preset-tuning (1-0) (30 CHANNEL RANDOM PRESET TUNING) switches. [S901: 1, S902: 2, S903: 3, S904: 4, S905: 5, S906: 6, S907: 7, S908: 8, S909: 9, S910: 0]
- S914 : Power (POWER) switch.
- S916~918, 921~923 : Input selector switches. [S916: PHONO, S917: TUNER, S918: TAPE, S921: VCR 2, S922: VCR 1, S923: CD]
- S925 : Loudness (LOUDNESS) switch.
- S929, 936 : Tuning (TUNING) switches. [S929: DOWN, S936: UP]
- S930, 931, 932 : Band selector switches. [S930: FM, S931: LW/AM, S932: MW (For (E, EB) areas.)]
- S933 : FM mode selector (FM MODE) switch.
- S934 : Memory scan (MEMORY SCAN) switch.
- S935 : Memory (MEMORY) switch.

- Signal line
  - : FM OSC signal
  - : AM (MW/LW) OSC signal
  - : Phono signal
  - : Positive voltage lines
  - : Negative voltage lines
  - : FM signal
  - : AM (MW/LW) signal
  - : AF signal (Lch)
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.

*Figures in ( ) Stand for DC-voltage in AM (MW) signal reception mode.

*Figures in [ ] Stand for DC-voltage in LW signal reception mode.

- The supply part number is described alone in the replacement parts list.

Ref. No.	Production Part No.	Supply Part No.
IC301	AN7470	SVIUPC1161C3
Z891	RCDHC-677-E	RCDHC-677

***Caution!**

IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.

*Cover the parts boxes made of plastics with alminum foil.

*Ground the soldering iron.

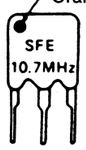
*Put a conductive mat on the work table.

*Do not touch the legs of IC or LSI with the fingers directly.

Note 2:

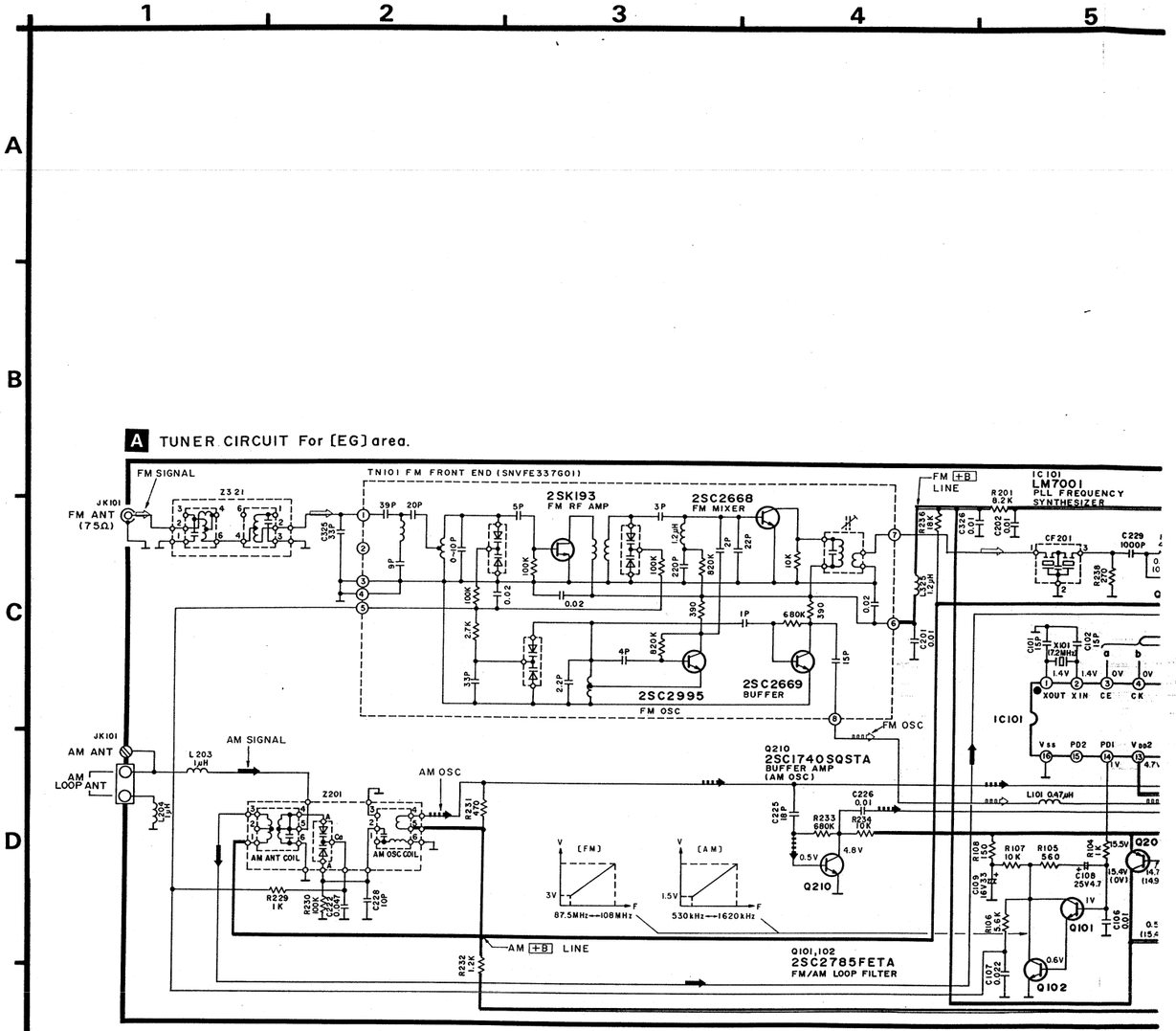
- **Use of ceramic filters in pairs**
  The ceramic filters (CF201, CF202) for FM-IF circuit are available in three ranks. For this circuit, be sure to use the ceramics of the same rank in a pair.
  At repairing and replacement, pay close attention to the short jumpers (J221, J222) for use as different short jumpers must be used depending on each rank of the ceramic filters.

Color marking (Blue, Red or Orange)

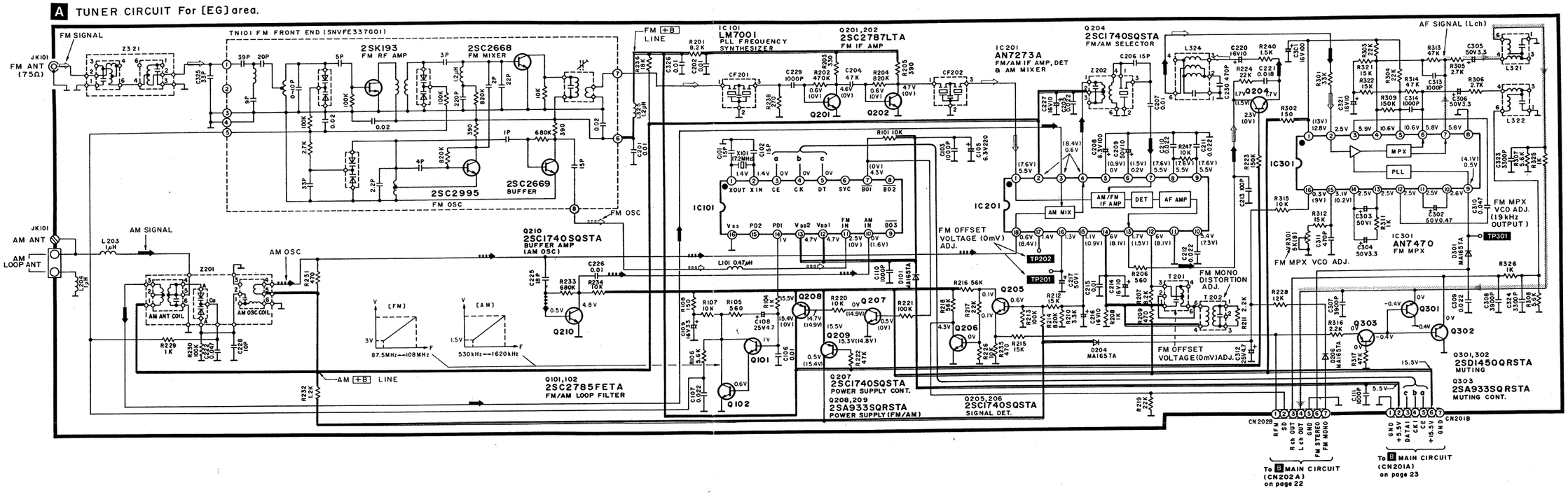


RANK (Color)	J221 (BL)	J222 (OR)	CENTER FREQUENCY
Blue	○	×	10.675MHz
Red	○	○	10.700MHz
Orange	×	○	10.725MHz

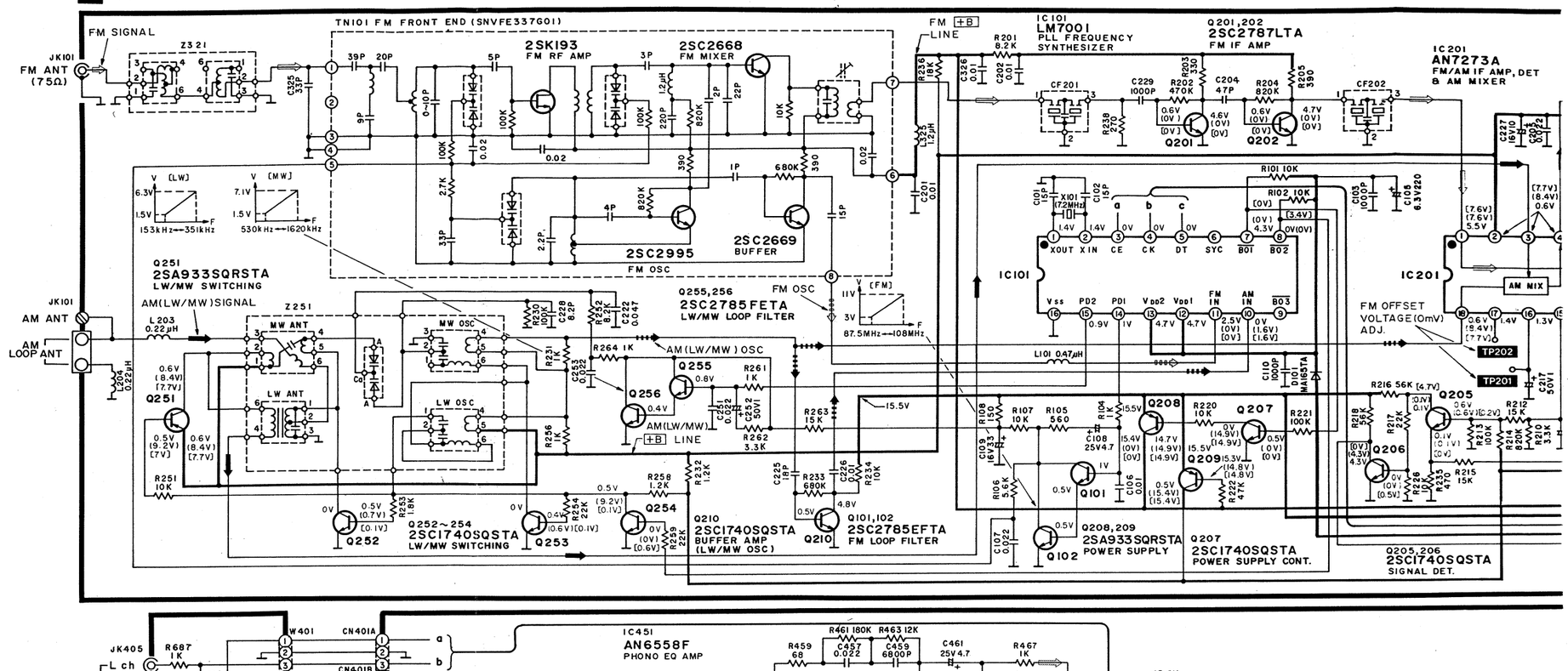
Note: ○ mark: short jumper is used.
× mark: short jumper is not used.



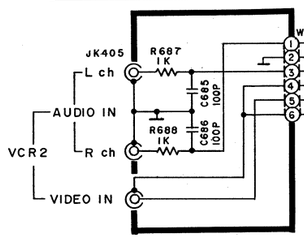
A TUNER CIRCUIT For [EG] area.



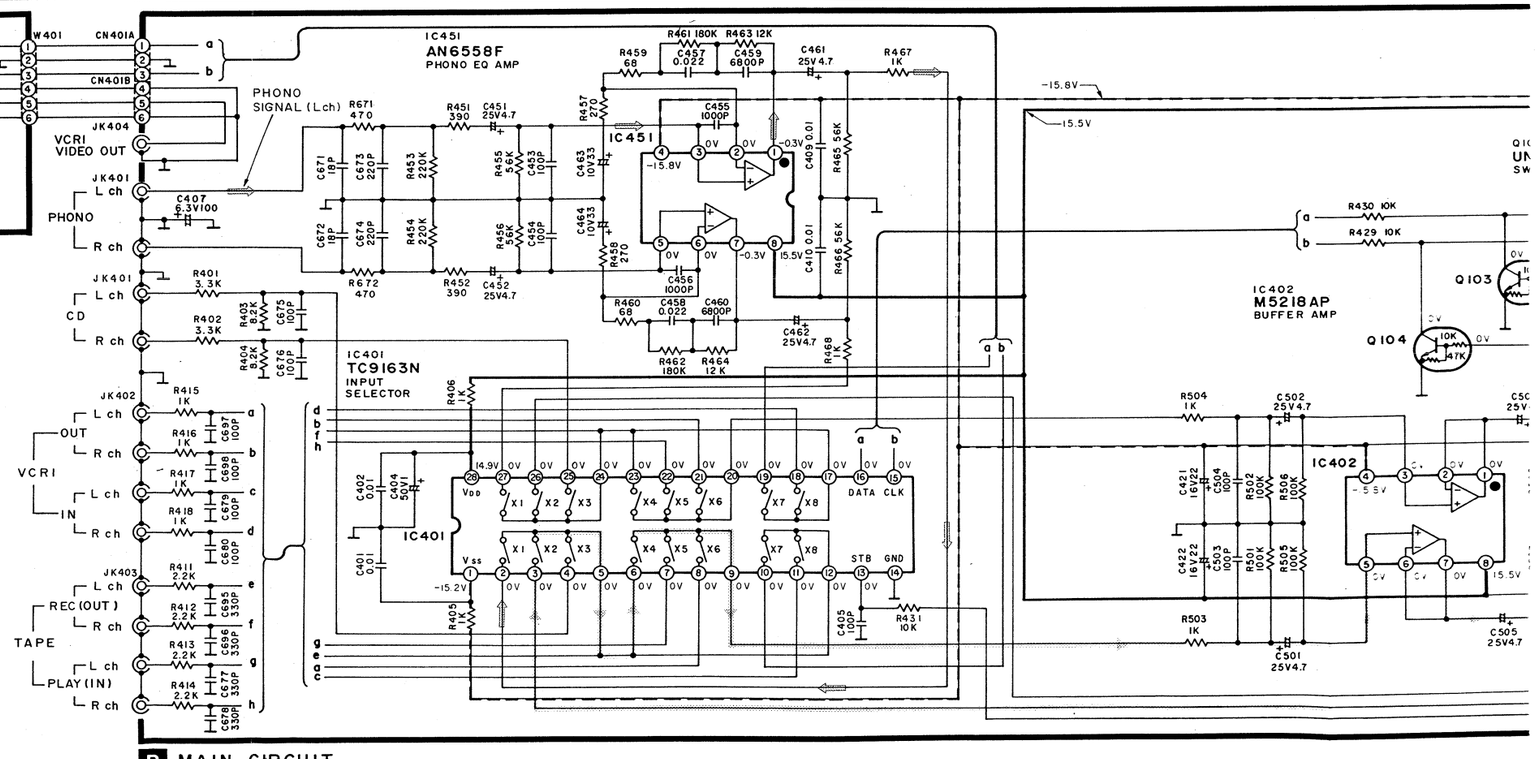
A TUNER CIRCUIT For [E,EB] areas.



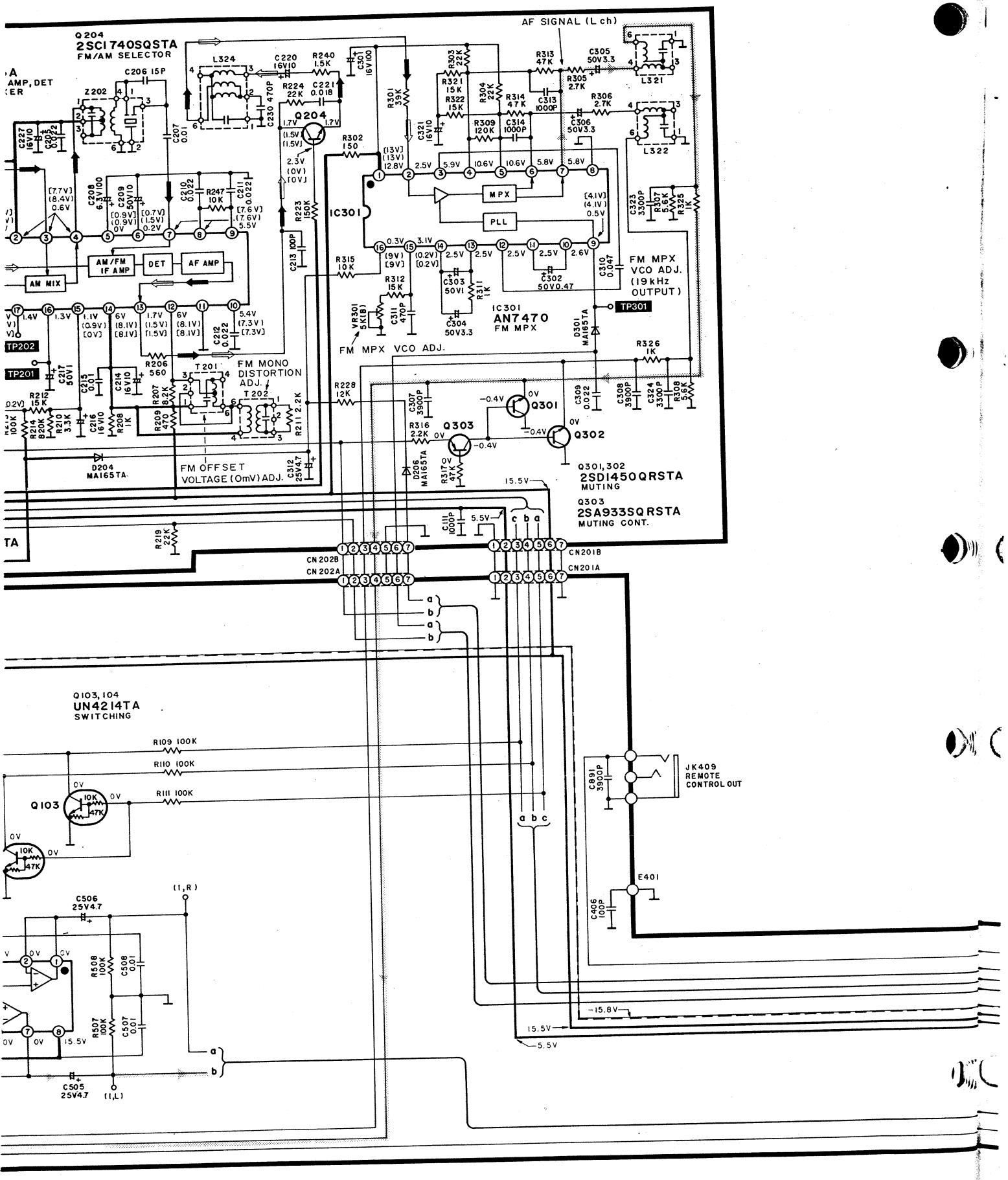
C VCR2 CIRCUIT



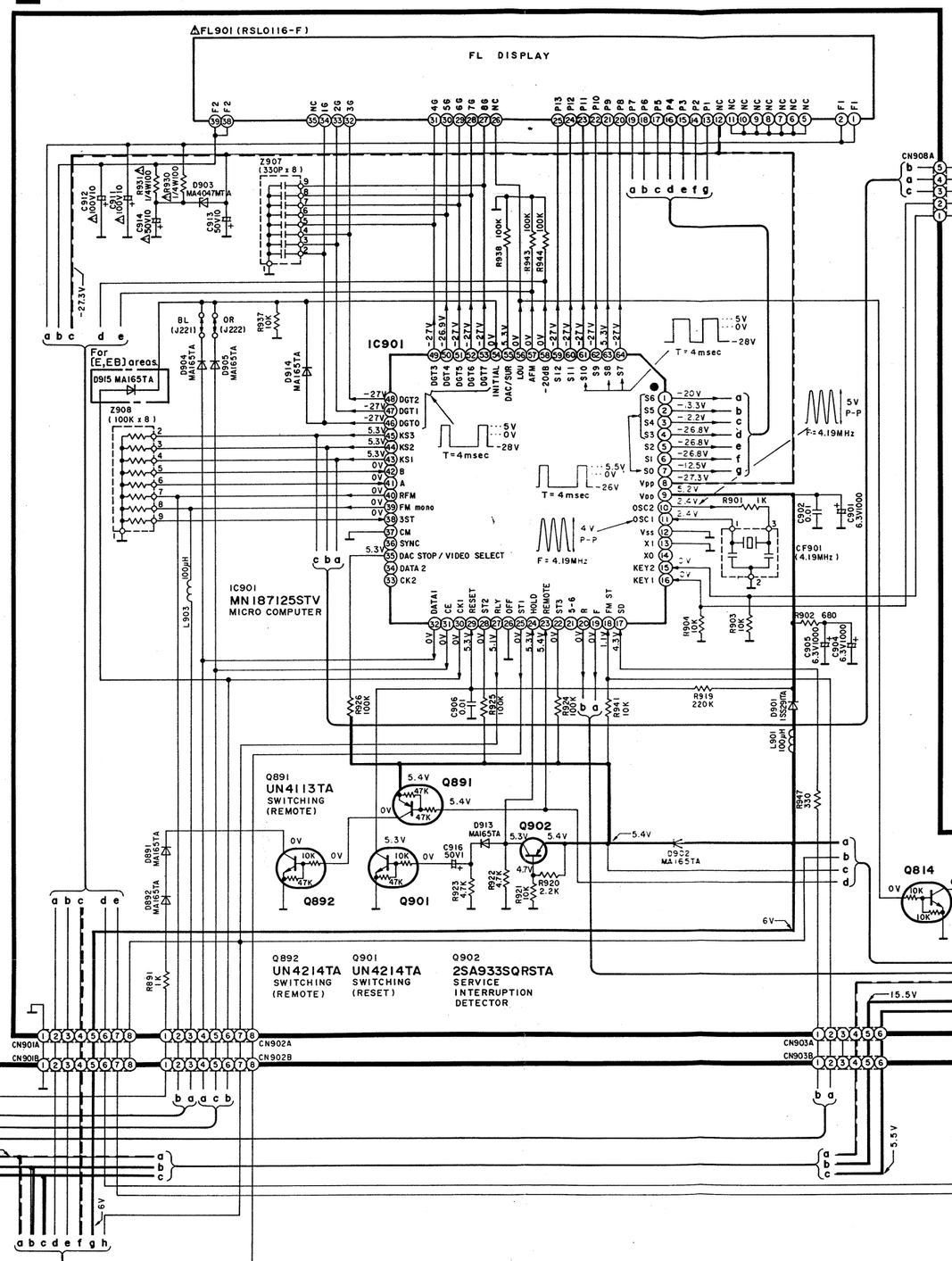
B MAIN CIRCUIT



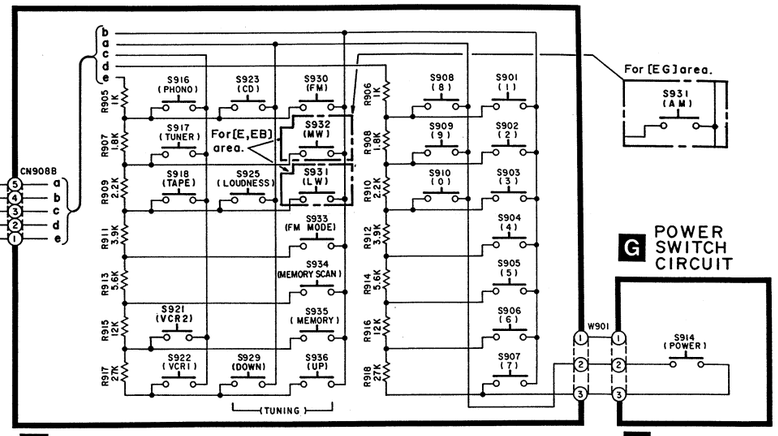
20 21 22 23


Q204
2SC1740SQSTA
FM/AM SELECTOR
AF SIGNAL (L ch)
IC301
AN7470
FM MPX
MPX
PLL
AM/FM IF AMP
DET
AF AMP
AM MIX
FM MPX VCO ADJ. (19kHz OUTPUT)
FM MPX VCO ADJ.
FM MONO DISTORTION ADJ.
FM OFFSET VOLTAGE (0mV) ADJ.
Q301, 302
2SD1450QRSTA
MUTING
Q303
2SA933SQRSTA
MUTING CONT.
Q103, 104
UN4214TA
SWITCHING
JK409
REMOTE CONTROL OUT
CN202B
CN202A
CN201B
CN201A
TP201
TP202
TP301
D204 MA165TA
D206 MA165TA
D301 MA165TA
15.5V
-15.8V
5.5V

D FL DRIVE CIRCUIT

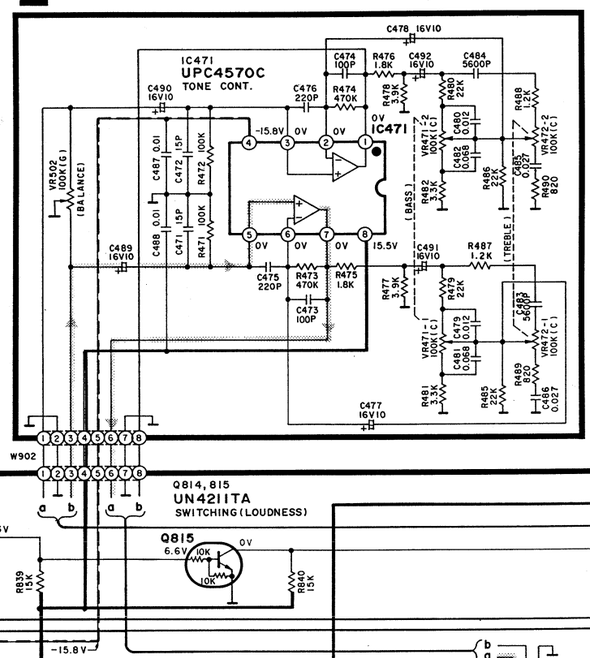


E OPERATION CIRCUIT

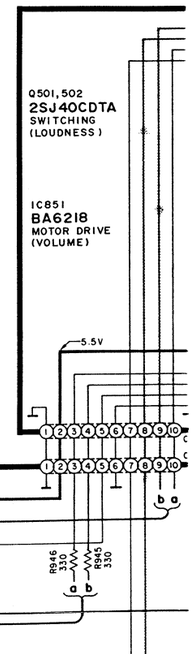


G POWER SWITCH CIRCUIT

F TONE CONTROL CIRCUIT



H VOLUME CI



G] area.

S931 (AM)

POWER SWITCH CIRCUIT

S914 (POWER)

VOLUME CIRCUIT

(VOLUME)

VR501-2 100K(B)

VR501-1 100K(B)

MOTOR

Q501

Q502

IC851

DIRECTION SELECT

DRIVE

L851 1μH

L852 1μH

R851 1/2W2.2

CN501A

CN501B

Q893
2SA933SQRSTA
LED DRIVE

Z891
RCDHC-677-E
(REMOTE SENSOR)

Q511,512
2SC3327ABTP
ATTENUATOR

Q503,504
2SC3327ABTP
MUTING

IC601
SVI3205B
POWER AMP

MUTE DET

AC DET

Q505,506
2SA1309AQSTA
MUTING/ATT. CONT.

Q701
2SD1761DEF
REGULATOR

Q703
2SC2631QRSTA
REGULATOR

Q601
2SA992EFTA
RELAY DRIVE

D601 MA165TA

RL601

Q705
2SC3940AQSTA
REGULATOR

Q704, 713
2SC3311AQSTA
STABILIZER

Q752
2SC3940AQSTA
REGULATOR

Q751
UN421FTA
RELAY DRIVE

D751~754
ISR35200TB

Q710

Q708

Q708, 710
2SB1187DEF
REGULATOR

D701~704
P300DLF

Q651, 653~655
2SA1309AQSTA
MOTOR DRIVE

Q654

Q655

Q651

Q653

Q652

D653 MA165TA

D652 MA4068MTA

D654 MA165TA

D651 MA165TA

FAN MOTOR

CN651

Q652
2SB621AQSTA
MOTOR DRIVE

JK601

JK602

L ch

R ch

A

B

SPEAKERS

E403

W601

CN601A

CN601B

J SPEAKER SWITCH/ HEADPHONES JACK CIRCUIT

S601-2 (B)

S601-1 (A)

(SPEAKERS)

HP601 HEADPHONES

For [EG] area.

CN751

I POWER SUPPLY CIRCUIT

W702

W701

CN702

RL751

T751

AC 11.7V

S701 (VOLT ADJ.)

240V

230V

F1 T2A

For [E,EB] areas.

T701

AC 32.8V

AC 32.8V

AC 5.7V

L701

JK791

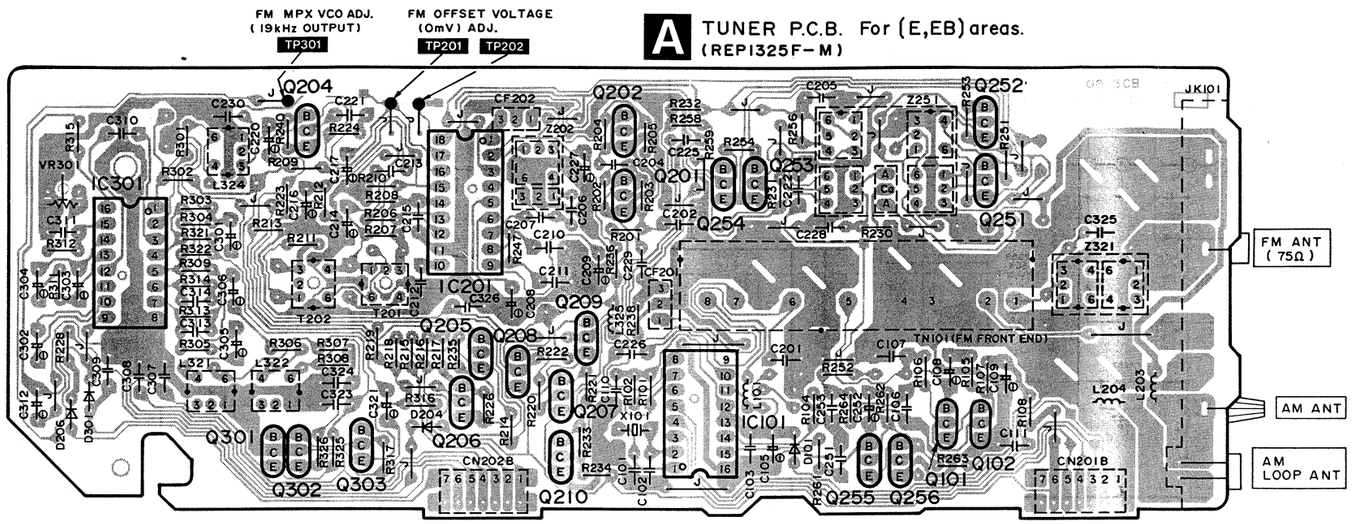
AC IN

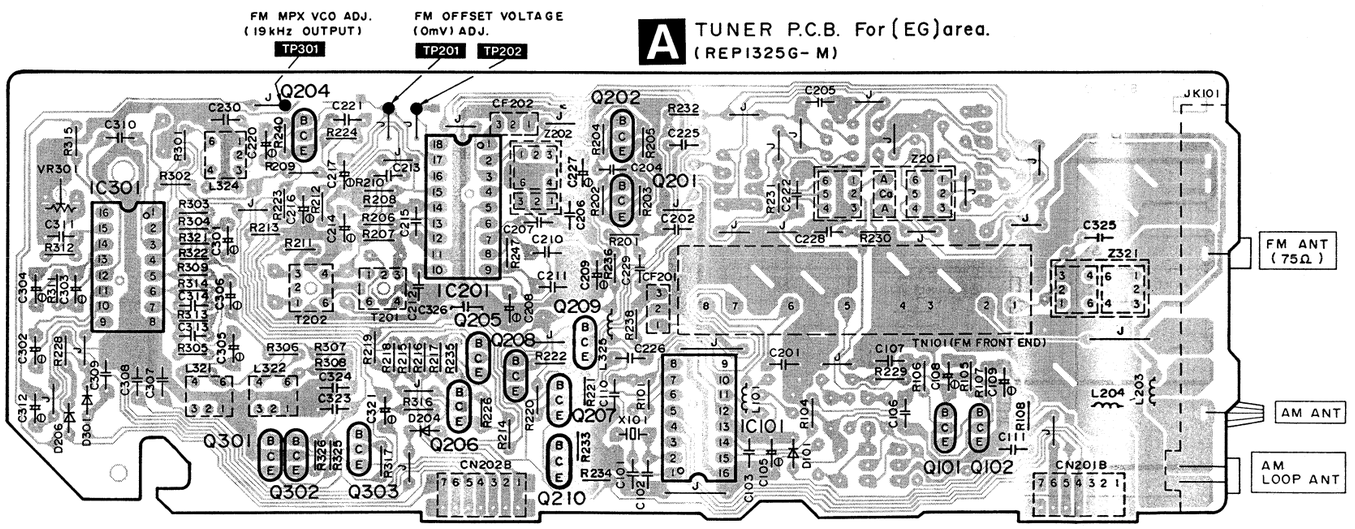
230/240V···[E,EB]

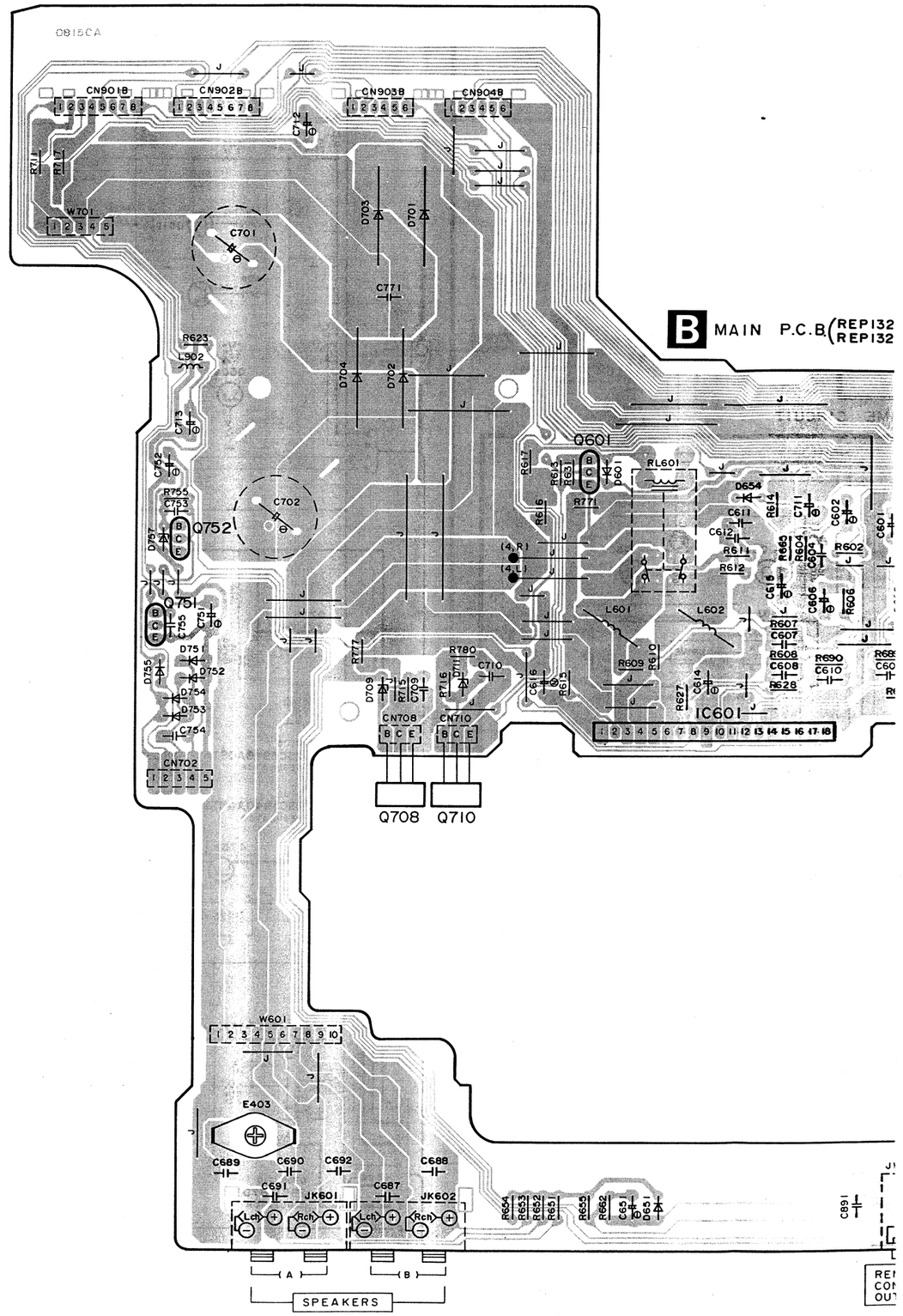
230V·····[EG]

50/60Hz

■ PRINTED CIRCUIT BOARDS

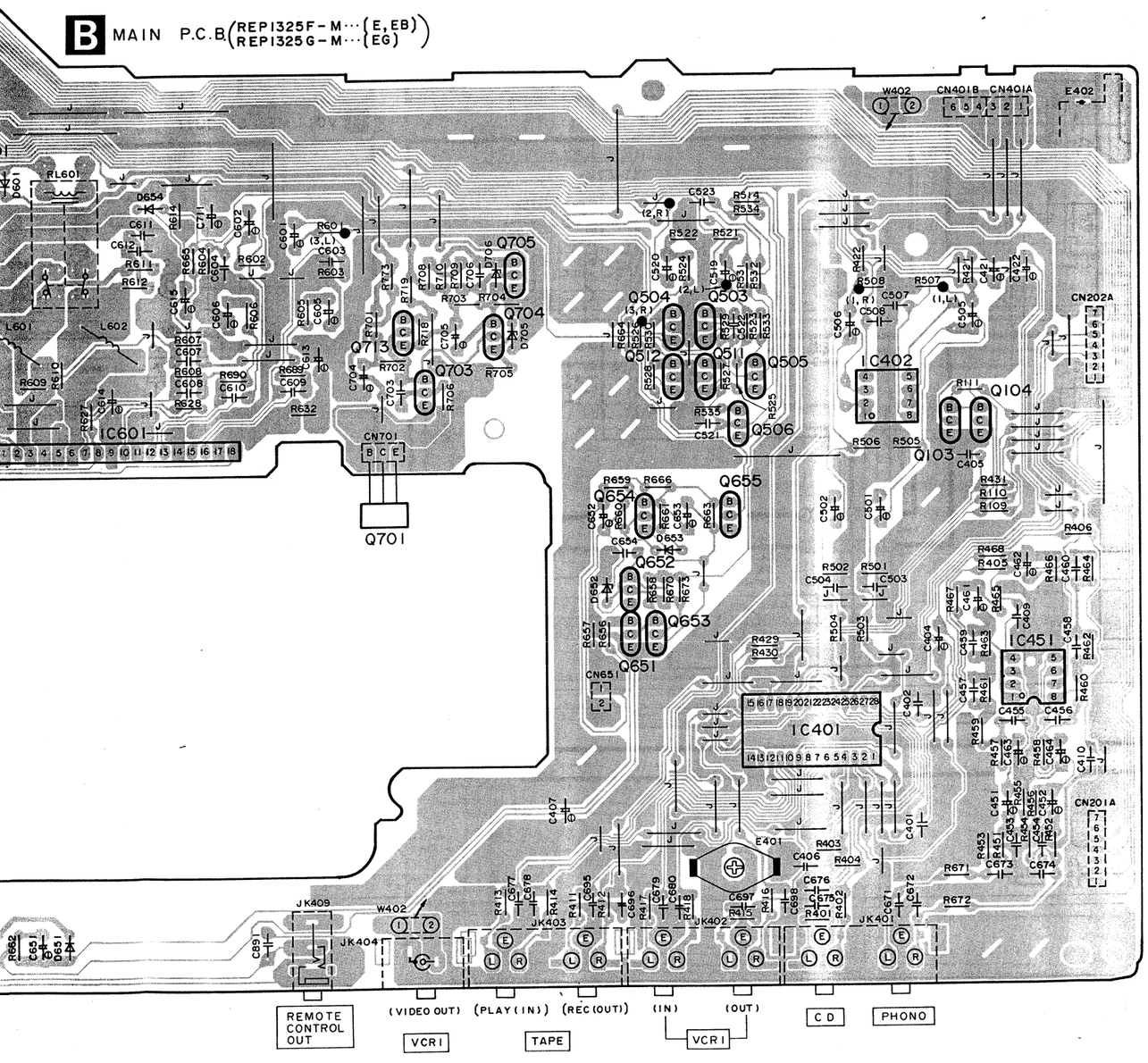




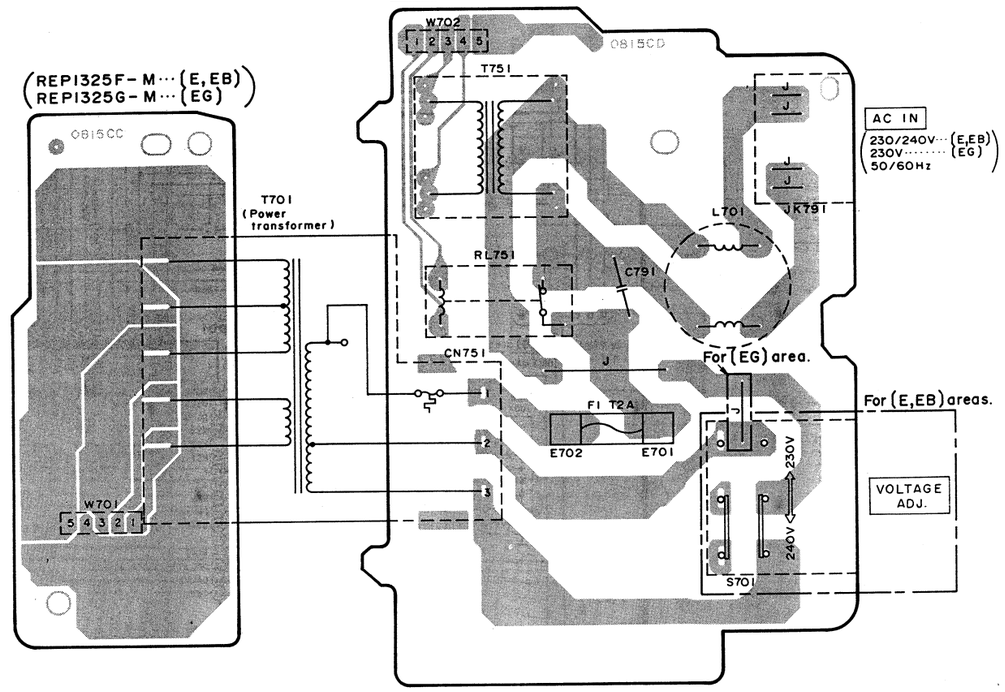


10 11 12 13 14 15 16 17 18 19

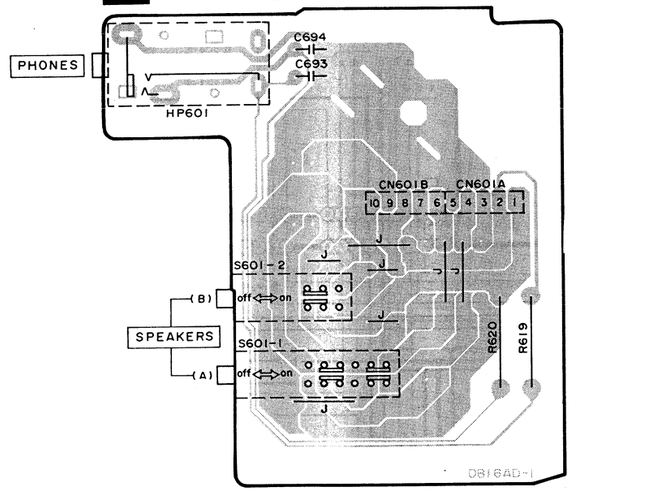
B MAIN P.C.B. (REPI325F-M···(E,EB) REPI325G-M···(EG))



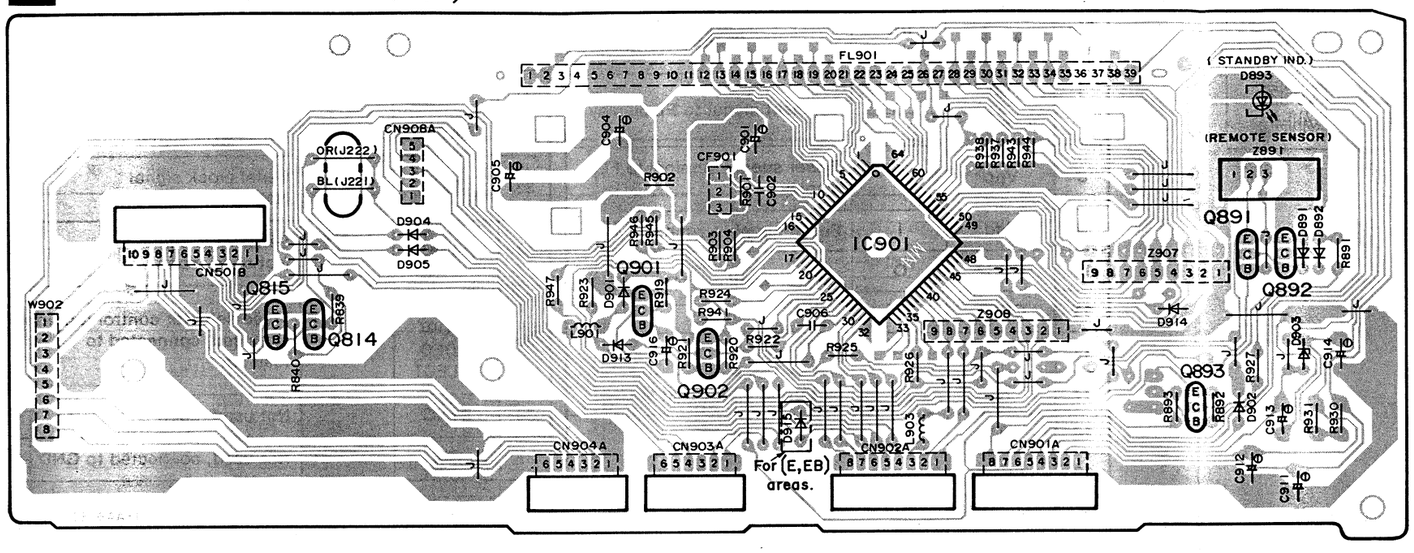
I POWER SUPPLY P.C.B. (REPI325F-M···(E,EB) REPI325G-M···(EG))



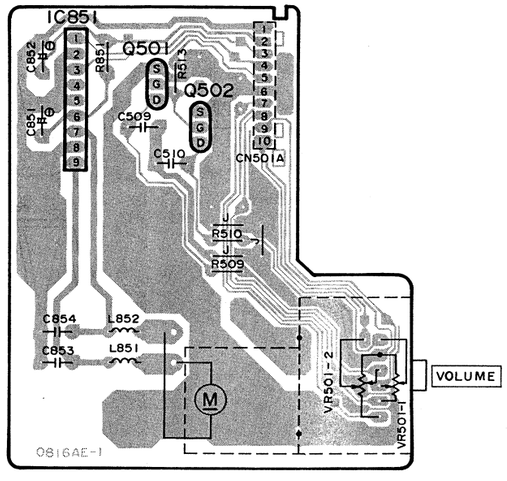
J SPEAKER SWITCH/HEADPHONES JACK P.C.B. (REPI326E-S···(E,EB) REPI326F-S···(EG))



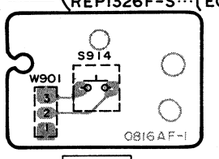
D FL DRIVE P.C.B. (REP1326E-S···(E,EB) REP1326F-S···(EG))



H VOLUME P.C.B. (REP1326E-S···(E,EB) REP1326F-S···(EG))

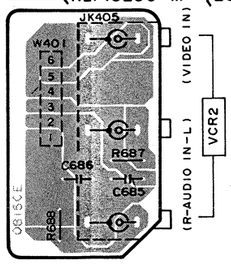


G POWER SWITCH P.C.B. (REP1326E-S···(E,EB) REP1326F-S···(EG))

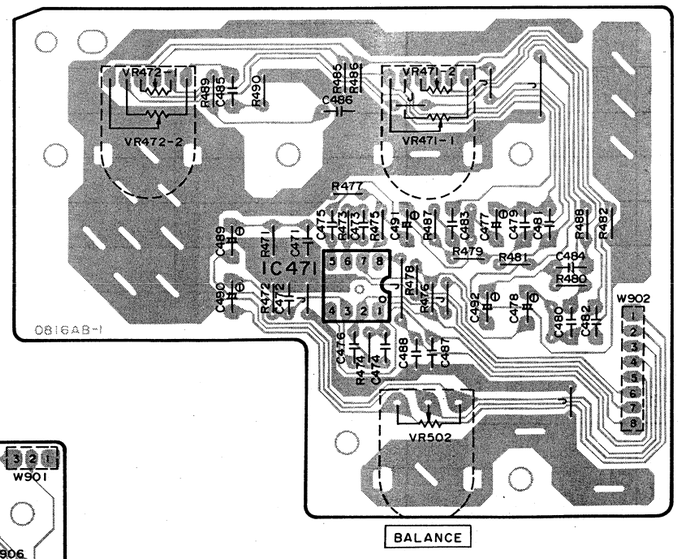


POWER

C VCR2 P.C.B. (REP1325F-M···(E,EB) REP1325G-M···(EG))

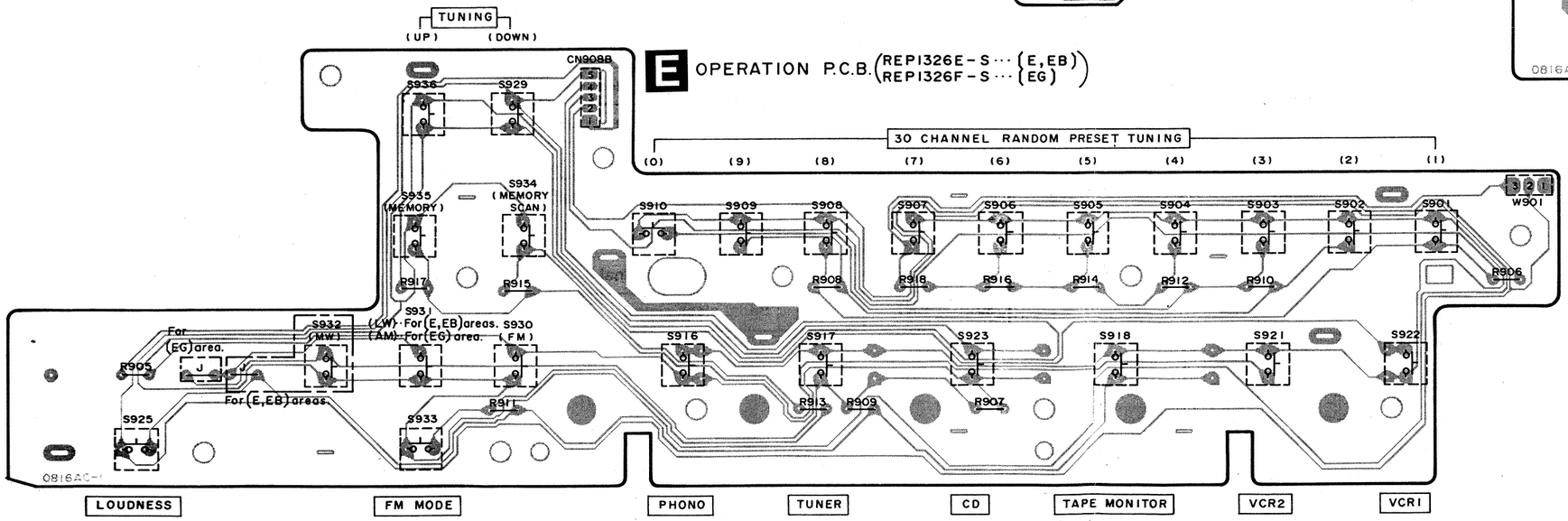


F TONE CONTROL P.C.B. (REP1326E-S···(E,EB) REP1326F-S···(EG))



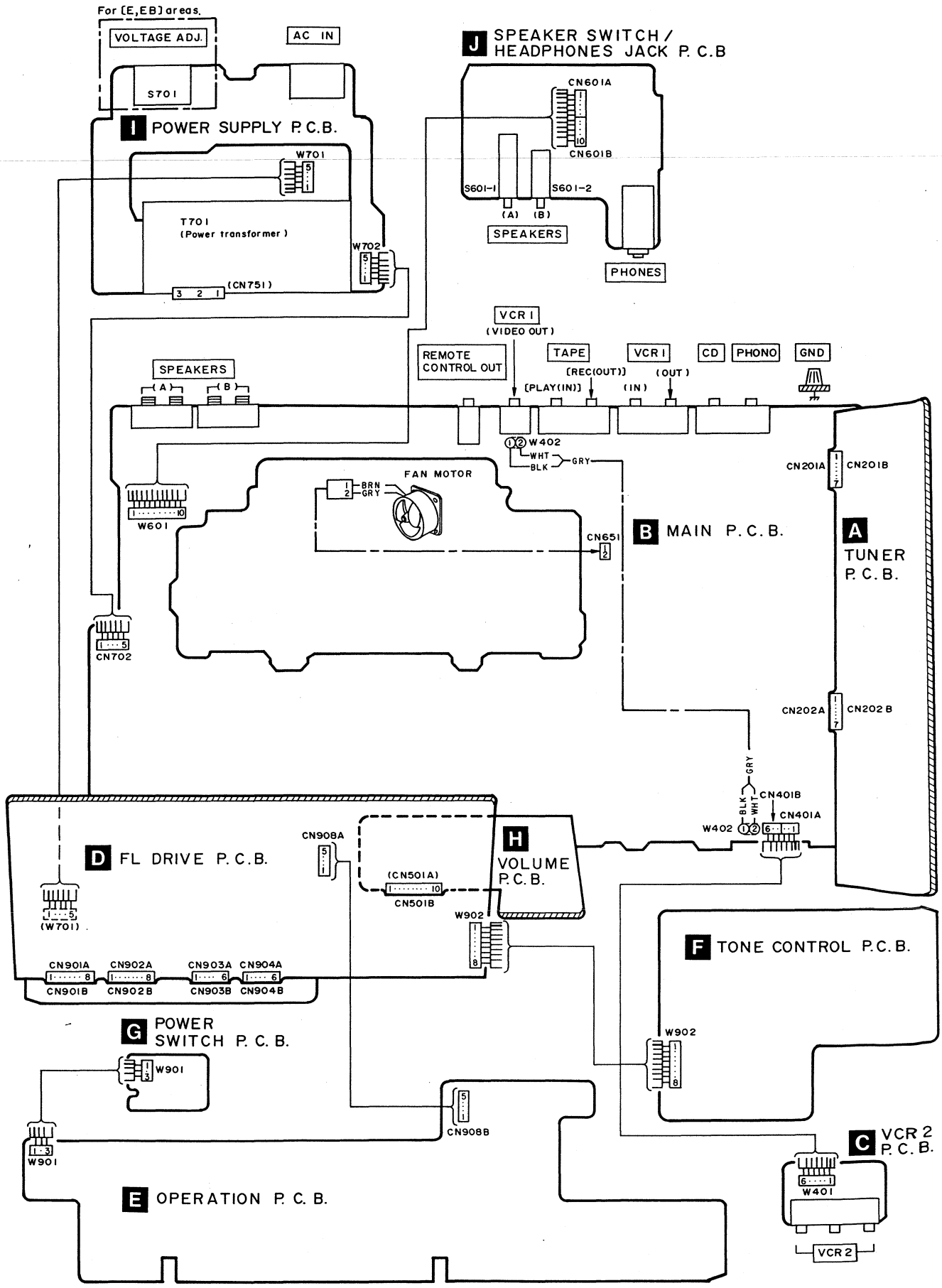
BALANCE

E OPERATION P.C.B. (REP1326E-S···(E,EB) REP1326F-S···(EG))

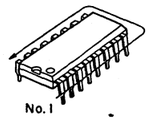


LOUDNESS | FM MODE | PHONO | TUNER | CD | TAPE MONITOR | VCR2 | VCR1

■ WIRING CONNECTION DIAGRAM

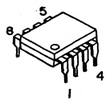


■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

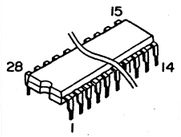


AN6558F	8 Pin
UPC4570C	8 Pin
AN7470	16 Pin
LM7001	16 Pin
AN7273A	18 Pin

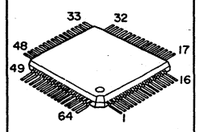
M5218AP



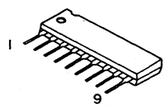
TC9163



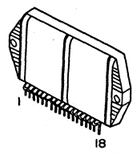
MN187125STV



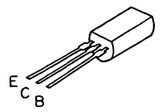
BA6218



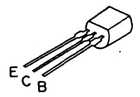
SVI3205B

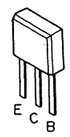


2SC3940AQSTA



2SA992EFTA
2SC2631QRSTA
2SB621AQSTA

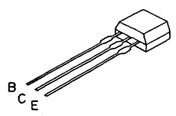




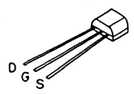
UN421FTA
UN4113TA
UN4211TA
UN4214TA
2SA1309AQSTA
2SC2785FETA
2SC2787LTA

2SC3311AQSTA
2SD1450QRSTA

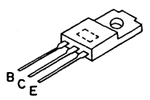
2SA933SQRSTA
2SC1740SQSTA
2SC3327ABTP



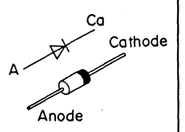
2SJ40CDTA



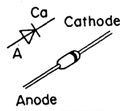
2SB1187DEF
2SD1761DEF



P300DLF



MA165TA
1SS291TA
1SR35200TB



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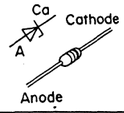
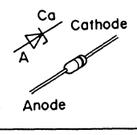
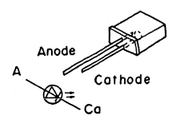
MA4062MTA
MA4068MTA



MA4160LTA
MA4270MTA

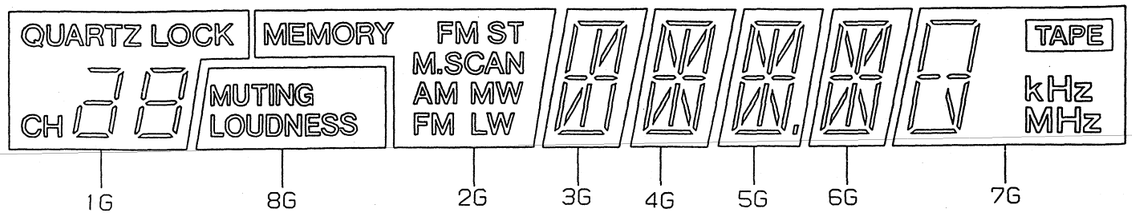


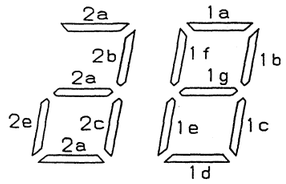
LN846RPH



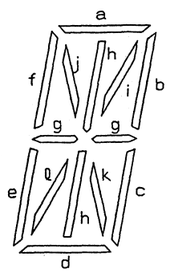
■ INTERNAL CONNECTION OF FL

• Grid connection diagram





(1G)



(7G~3G)

• Anode connection table

	1G	2G	3G	4G	5G	6G	7G	8G
P1	1a	–	a	a	a	a	a	–
P 2	2b	–	i, l	j	j	j	–	–
P 3	2c	AM	h	h	h	h	TAPE	–
P 4	2a	MW	–	i	i	i	–	–
P 5	1f	FM	f	f	f	f	f	–
P 6	1b	LW	b	b	b	b	b	–
P 7	1g	–	g	g	g	g	g	–
P 8	1e	–	e	e	e	e	e	–
P 9	1c	M.SCAN	c	c	c	c	c	MUTING
P10	2e	MEMORY	–	l	l	l	kHz	LOUDNESS
P11	1d	–	d	d	d	d	d	–
P12	QUARTZ LOCK	–	–	k	k	k	k	–
P13	CH	FM ST	–	–	0	–	MHz	–

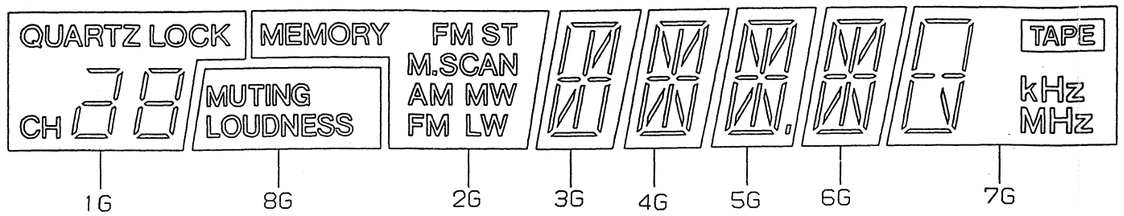
• Pin connection

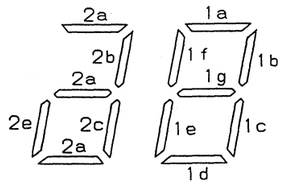
PIN NO.	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	NP	NP	NC	1G	2G	3G	4G	5G	6G	7G	8G	NC	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NC	NC	NC	NC	NC	NC	NC	NC	NC	NP	NP	F1	F1

NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) NC ------ No connection
4) 1G~8G --- Grid

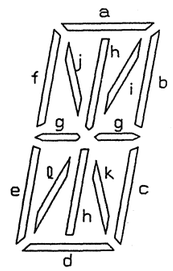
■ INTERNAL CONNECTION OF FL

• Grid connection diagram





(1G)



(7G~3G)

• Anode connection table

	1G	2G	3G	4G	5G	6G	7G	8G
P1	1a	–	a	a	a	a	a	–
P 2	2b	–	i , ℓ	j	j	j	–	–
P 3	2c	AM	h	h	h	h	TAPE	–
P 4	2a	MW	–	i	i	i	–	–
P 5	1f	FM	f	f	f	f	f	–
P 6	1b	LW	b	b	b	b	b	–
P 7	1g	–	g	g	g	g	g	–
P 8	1e	–	e	e	e	e	e	–
P 9	1c	M.SCAN	c	c	c	c	c	MUTING
P10	2e	MEMORY	–	ℓ	ℓ	ℓ	kHz	LOUDNESS
P11	1d	–	d	d	d	d	d	–
P12	QUARTZ LOCK	–	–	k	k	k	k	–
P13	CH	FM ST	–	–	0	–	MHz	–

• Pin connection

PIN NO.	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
CONNECTION	F2	F2	NP	NP	NC	1G	2G	3G	4G	5G	6G	7G	8G	NC	P32	P31	P30	P29	P28	P27	P26	P25	P24	P23	P22	P21	NC	NC	NC	NC	NC	NC	NC	NC	NP	NP	F1	F1

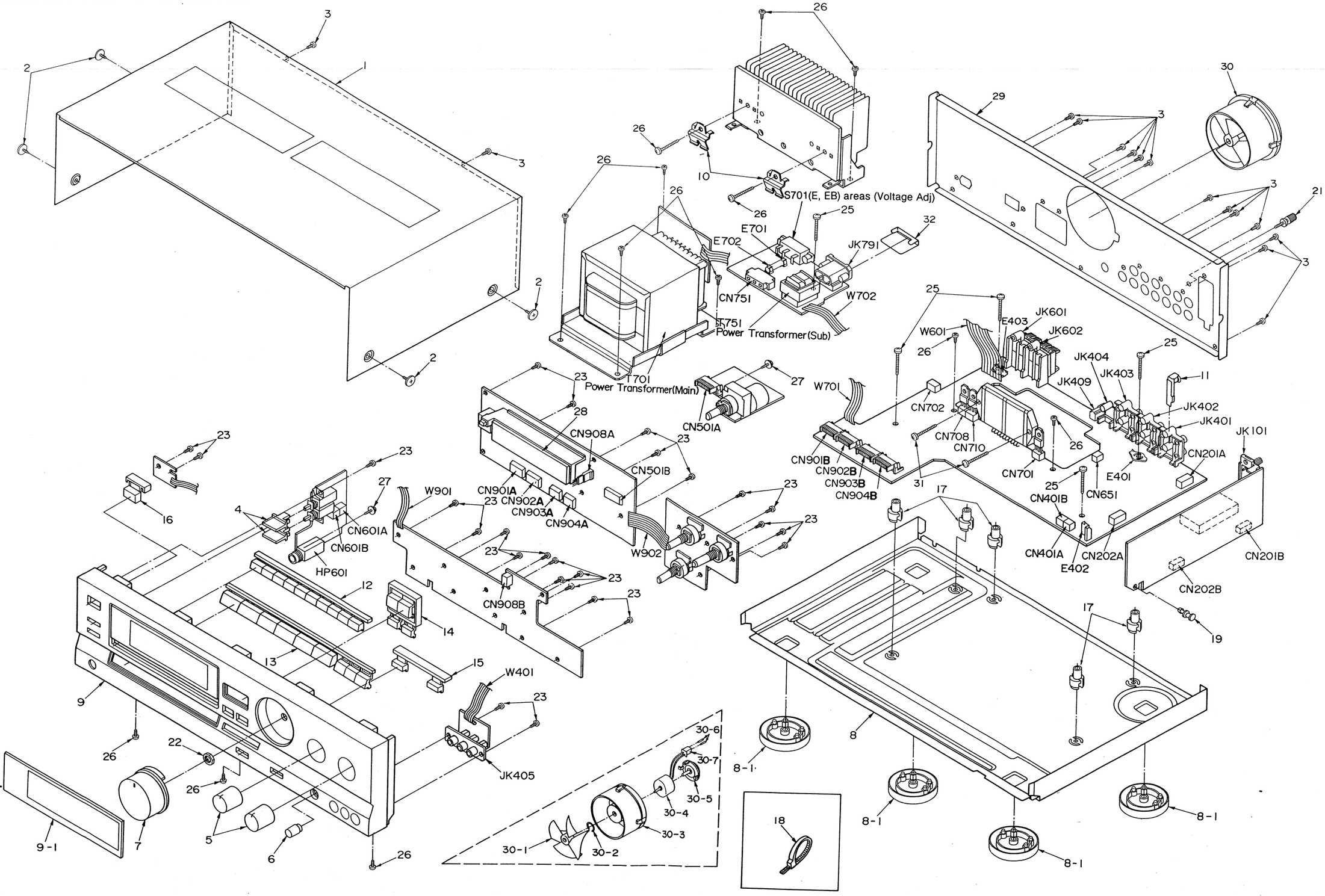
NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) NC ------ No connection
4) 1G~8G --- Grid

■ TERMINAL FUNCTION OF IC

• IC901 (MN187125STV): Microcomputer

Pin No.	Mark	I/O Division	Function
1 ~ 7	S0 ~ S6	O	Segment signal to FL display
8	Vpp	I	Power supply terminal to FL display
9	Vdd	I	Power supply terminal
10	OSC2	O	Crystal oscillator terminal (4.19MHz)
11	OSC1	I	
12	Vss	—	GND terminal
13	XI	—	Not used, connected to GND
14	XO	—	Not used, open
15	KEY2	I	Key return signal
16	KEY1		
17	SD	I	Received signal detect terminal
18	FM ST	I	Stereo signal detect terminal
19	F	O	Sense of rotation for volume motor control terminal
20	R		
21	5-6	—	Not used, open
22	ST3	—	Level shift control terminal Not used, connected to resister.
23	REMOTE	I	Remote control terminal
24	HOLD	I	Service interruption detect terminal
25	ST1	O	Level shift control terminal
26	OFF	—	Not used, connected to GND
27	RLY	O	Relay control terminal
28	ST2	—	Level shift control terminal Not used, connected to resister.
29	RESET	I	Reset detect terminal
30	CK1	O	Serial clock signal
31	CE	O	Chip enable terminal
32	DATA1	O	Serial data signal
33	CK2	—	Serial clock signal Not used, open
34	DATA2	—	Serial data signal Not used, open
35	DAC STOP/ VIDEO SELECT	—	Video selector control terminal Not used, connected to resister.
36	SYNC	—	Not used, open
37	CM	—	Not used, connected to GND
38	3ST	I	Not used, connected to resistor
39	FM mono	O	Forcible monaural signal
40	RFM	O	Muting control to tuner circuit
41	A	I	Rotary tuning control terminal Not used, connected to resister.
42	B		
43 ~ 45	KS1 ~ KS3	O	Key scan signal
46 ~ 53	DGT0 ~ DGT7	O	Digit signal to FL display
54	INITIAL	I	Serial data detect terminal
55	DAC/SUR	—	Muting control signal Not used, connected to resister.
56	LOU	O	Loudness control signal
57	AFM	O	Muting control to amplifier circuit
58	−20dB	O	Muting control (−20dB) to amplifier circuit
59 ~ 64	S7 ~ S12	O	Segment signal to FL display

■ CABINET PARTS LOCATION



■ REPL

Notes: *Import
Compo
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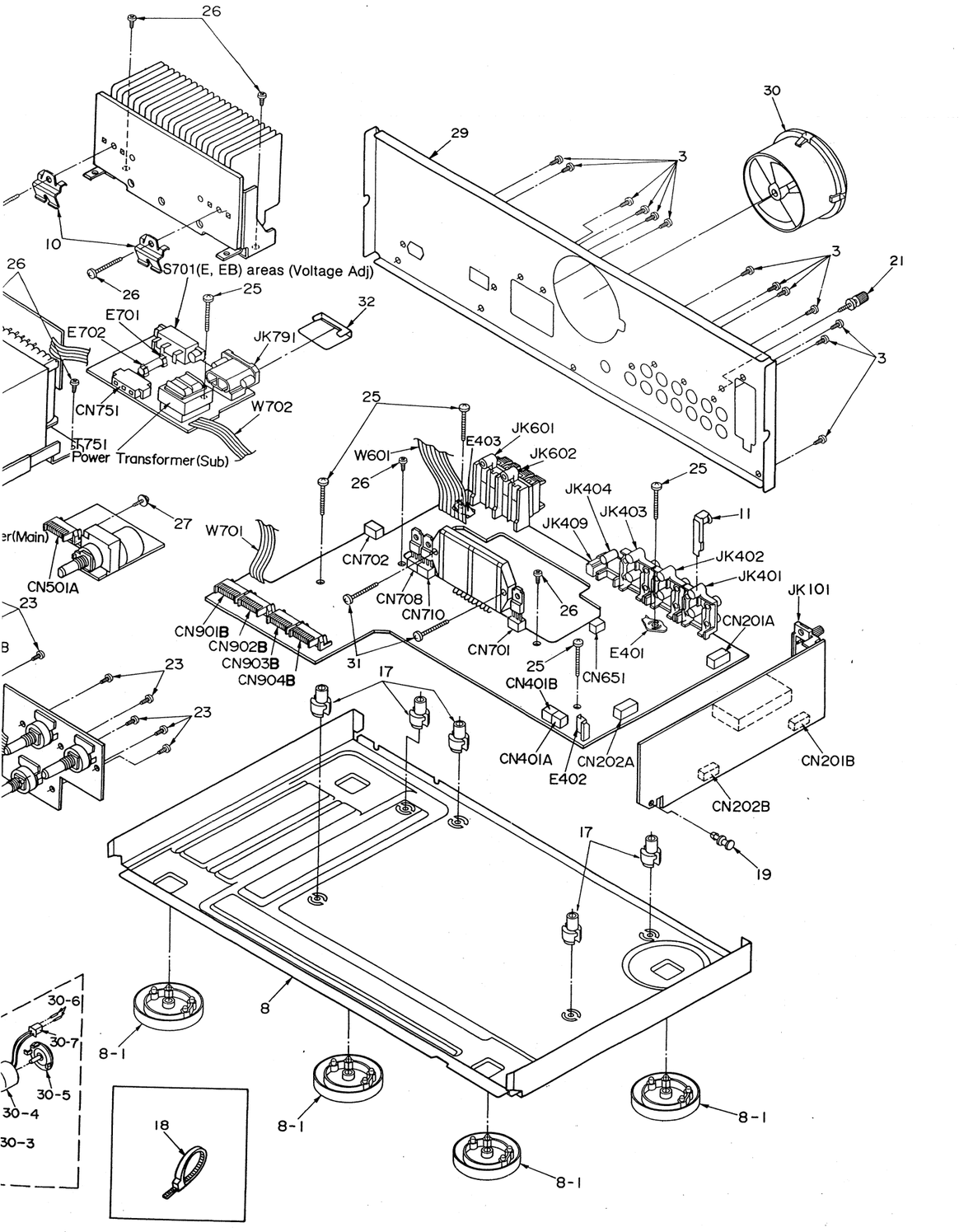
When
*The pa
Parts v
*Remot
Supply

Ref. No.	
1	RKMC
1	RKMC
2	SNE2
3	XTBS
4	RGUC
4	RGUC
5	RGWC
5	RGWC
6	RGWC
6	RGWC
7	RGWC
7	RGWC
8	RFKJ
8-1	RKA0
9	RFKG
9	RFKG
9	RFKG
9-1	RKW0
10	RMC0
11	RSC0
12	RGU0
12	RGU0
13	RGU0
13	RGU0
13	RGU0
14	RGU0
14	RGU0
15	RGU0
15	RGU0
16	RGU0
16	RGU0
17	SHE1
18	SHR3(
19	SHR8(
21	SNE2
22	XNS7
23	XTBS:
25	XTB3
26	XTB3
27	XTWS:
28	RMN0
29	RGR0



■REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y:
Supply period for three years from termination of production.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0036B-K	CABINET	(K) (E, EB, EG)
1	RKM0036B-S	CABINET	(S) (EG)
2	SNE2129-3	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	RGU0101	BUTTON, SPEAKERS	(K) (E, EB, EG)
4	RGU0101-S	BUTTON, SPEAKERS	(S) (EG)
5	RGW0072	KNOB, TONE CONTROLS	(K) (E, EB, EG)
5	RGW0072-S	KNOB, TONE CONTROLS	(S) (EG)
6	RGW0073	KNOB, BALANCE	(K) (E, EB, EG)
6	RGW0073-S	KNOB, BALANCE	(S) (EG)
7	RGW0084	KNOB, VOLUME	(K) (E, EB, EG)
7	RGW0084-S	KNOB, VOLUME	(S) (EG)
8	RFKJAGX500PP	CHASSIS ASS'Y	
8-1	RKA0009-1	FOOT	
9	RFKGGX230EK	FRONT PANEL ASS'Y	(K) (E, EB)
9	RFKGGX230EGK	FRONT PANEL ASS'Y	(K) (EG)
9	RFKGGX230EGS	FRONT PANEL ASS'Y	(S) (EG)
9-1	RKW0089C-Q	CLEAR PANEL	
10	RMC0158	TRANSISTOR HOLDER	
11	RSC0105	SHIELD PLATE	
12	RGU0344A-K1	BUTTON, PRESET TUNING	(K) (E, EB, EG)
12	RGU0344A-S	BUTTON, PRESET TUNING	(S) (EG)
13	RGU0394E-K1	BUTTON, INPUT SELECTOR	(K) (E, EB)
13	RGU0394D-K1	BUTTON, INPUT SELECTOR	(K) (EG)
13	RGU0394D-S	BUTTON, INPUT SELECTOR	(S) (EG)
14	RGU0347-K1	BUTTON, TUNING	(K) (E, EB, EG)
14	RGU0347-S	BOTTON, TUNING	(S) (EG)
15	RGU0348A-K1	BUTTON, MODE/LOUDNESS	(K) (E, EB, EG)
15	RGU0348A-S	BUTTON, MODE/LOUDNESS	(S) (EG)
16	RGU0380	BUTTON, POWER	(K) (E, EB, EG)
16	RGU0380-S	BUTTON, POWER	(S) (EG)
17	SHE187-2	P.C.B. SUPPORT	
18	SHR301	FASTNER	
19	SHR8006	SPACER	
21	SNE2123	GND TERMINAL	
22-	XNS7FZ	NUT	
23	XTBS26+8J	SCREW	
25	XTB3+20JFZ	SCREW	
26	XTB3+8JFZ	SCREW	
27	XTWS3+10Q	SCREW	
28	RMN0170	FL HOLDER	
29	RGR0145D-A1	REAR PANEL	(E)

Ref. No.	Part No.	Part Name & Description	Remarks
29	RGR0145D-B1	REAR PANEL	(EB)
29	RGR0145E-A	REAR PANEL	(EG)
30	SYE1128-2	COOLING FAN UNIT	
30-1	SHE232	COOLING FAN	
30-2	SUS271	SPRING	
30-3	SHE233	COOLING FAN CASE	
30-4	MDN-4RB4MRC	MOTOR	
30-5	SHE234	COOLING FAN CASE CAP	
30-6	SJT783	CONNECTOR TERMINAL	
30-7	SJS5215	SOCKET(2P)	
31	XTW3+15T	SCREW	
32	RMZ0204	AC INLET BARRIER	(K) (E, EB, EG)
		PACKING MATERIAL	
P1	RPG1264	PACKING CASE	(K) (E, EB)
P1	RPG1311	PACKING CASE	(K) (EG)
P1	RPG1333	PACKING CASE	(S) (EG)
P2	RPN0328	PADS	
P3	XZB52X60A01Z	PROTECTION BAG(UNIT)	
P4	XZB24X34C04	PROTECTION BAG(ACCESSORIES)	
P5	RPQ0164	PAD	
		ACCESSORIES	
A1	RFKSAGX130EK	INST. MANUAL ASS'Y	(E)
A1	RQT1550-B	INSTRUCTION MANUAL	(EB)
A1	RQT1549-D	INSTRUCTION MANUAL	(EG)
A2	RQA0013	WARRANTY CARD	
A3	RQCB0169	SERVICENTER LIST	
A4	RJA0019-1K	AC POWER SUPPLY CORD	(E, EG) ⚠
A4	SJA193	AC POWER SUPPLY CORD	(EB) ⚠
A5	RSA0007	FM INDOOR ANTENNA	
A6	SPB1163T	AM LOOP ANTENNA	
A6-1	SMA231M	AM ANTENNA HOLDER	
A6-2	XTN3+10AFZ	SCREW	
A7	RAK-SA302E	REMOTE CONTROL TRANSMITTER	
A7-1	RKK0020-K	BATTERY COVER	FOR R/C TRANSMITTER
A8	SJP9009	AC PLUG ADAPTOR	(EB) ⚠
A9	RQLA0134	VOLTAGE CAUTION LABEL	(E, EB)

SA-GX230

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC101	LM7001	IC, PLL FREQ. SYNTHESIZER	
IC201	AN7273A	IC, AM/FM IF AMP & MIXER	
IC301	SVIUPC1161C3	IC, FM MPX	
IC401	TC9163N	IC, INPUT SELECTOR	
IC402	M5218AP	IC, BUFFER AMP	
IC451	AN6558F	IC, PHONO EQ AMP	
IC471	UPC4570C	IC, TONE CONTROL	
IC601	SVI3205B	IC, POWER AMP	⚠
IC851	BA6218	IC, VOLUME MOTOR DRIVE	
IC901	MN187125STV	IC, MICROCOMPUTER	
		TRANSISTOR(S)	
Q101, 102	2SC2785FE	TRANSISTOR	
Q103, 104	UN4214TA	TRANSISTOR	
Q201, 202	2SC2787L	TRANSISTOR	
Q204-207	2SC1740SQ	TRANSISTOR	
Q208, 209	2SA933SQR	TRANSISTOR	
Q210	2SC1740SQ	TRANSISTOR	
Q251	2SA933SQR	TRANSISTOR	(E, EB)
Q252-254	2SC1740SQ	TRANSISTOR	(E, EB)
Q255, 256	2SC2785FE	TRANSISTOR	(E, EB)
Q301, 302	2SD1450QRSTA	TRANSISTOR	
Q303	2SA933SQR	TRANSISTOR	
Q501, 502	2SJ40CDTA	TRANSISTOR	
Q503, 504	2SC3327-A	TRANSISTOR	
Q505, 506	2SA1309A-R	TRANSISTOR	
Q511, 512	2SC3327-A	TRANSISTOR	
Q601	2SA992EFTA	TRANSISTOR	
Q651	2SA1309A-R	TRANSISTOR	
Q652	2SB621AQSTA	TRANSISTOR	
Q653-655	2SA1309A-R	TRANSISTOR	
Q701	2SD1761DEF	TRANSISTOR	⚠
Q703	2SC2631QRSTA	TRANSISTOR	
Q704	2SC3311A-Q	TRANSISTOR	
Q705	2SC3940AQSTA	TRANSISTOR	
Q708	2SB1187DEF	TRANSISTOR	⚠
Q710	2SB1187DEF	TRANSISTOR	
Q713	2SC3311A-Q	TRANSISTOR	⚠
Q751	UN421FTA	TRANSISTOR	
Q752	2SC3940AQSTA	TRANSISTOR	
Q814, 815	UN4211	TRANSISTOR	
Q891	UN4113TA	TRANSISTOR	
Q892	UN4214TA	TRANSISTOR	
Q893	2SA933SQR	TRANSISTOR	
Q901	UN4214TA	TRANSISTOR	
Q902	2SA933SQR	TRANSISTOR	
		DIODE(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
D101	MA165	DIODE	
D204	MA165	DIODE	
D206	MA165	DIODE	
D301	MA165	DIODE	
D601	MA165	DIODE	
D651	MA165	DIODE	
D652	MA4068M	DIODE	
D653, 654	MA165	DIODE	
D701-704	P300DLF	DIODE	⚠
D705, 706	MA4062MTA	DIODE	
D709	MA4270	DIODE	
D711	MA4160-L	DIODE	
D751-754	1SR35200TB	DIODE	⚠
D755	MA165	DIODE	
D757	MA4068M	DIODE	
D891, 892	MA165	DIODE	
D893	LN846RPH	L. E. D.	
D901	1SS291TA	DIODE	
D902	MA165	DIODE	
D903	MA4047MTA	DIODE	
D904, 905	MA165	DIODE	
D913, 914	MA165	DIODE	
D915	MA165	DIODE	(E, EB)
		VARIABLE RESISTOR(S)	
VR301	EVNDXAA00B53	V. R, MPX VCO ADJ.	
VR471, 472	EWC2XAF25C15	V. R, TONE CONTROL	
VR501	EUWMNYF20B15	V. R, VOLUME CONTROL	
VR502	EWHFDA014G15	V. R, BALANCE CONTROL	
		COIL(S)	
L101	RLQZPR47KT-Y	COIL	
L203, 204	ELEPKR22MA	COIL	(E, EB)
L203, 204	ELEPK1R0MA	COIL	(EG)
L321, 322	RLM2B003-K	COIL	
L324	SLM1B10-1M	COIL	
L325	RLQZP1R2KT-Y	COIL	
L601, 602	SLQY07G-40	COIL	
L701	SLQZ650MH49	COIL	⚠
L851, 852	RLQZP1R0KT-Y	COIL	
L901, 902	ELEPK101KA	COIL	
L903	ELEXT101KA9	COIL	
		TRANSFORMER(S)	
T201	RL14B002-Z	FM OFFSET	
T202	RL14B003-Z	FM OFFSET	
T701	RTP1N5B013-W	POWER TRANSFORMER(MAIN)	⚠
T751	RTP1I5E003-V	POWER TRANSFORMER(SUB)	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
		COMPONENT COMBINATION(S)	
Z201	RLA2Z001-T	COMPONENT COMBINATION	(EG)
Z202	SLI7Z101-T	COMPONENT COMBINATION	
Z251	RLA6Z002-T	COMPONENT COMBINATION	(E, EB)
Z321	SLA4Z13-2	COMPONENT COMBINATION	
Z891	RCDHC-677	REMOTE SENSOR	
Z907	EXFP8331MW	COMPONENT COMBINATION	
Z908	EXBF9E104J	COMPONENT COMBINATION	
		FILTER(S) & OSCILLATOR(S)	
CF201, 202	RLFKTF2M01LA	RED(10.700MHz)	
CF201, 202	RLFKTF2M01LB	BLUE(10.675MHz)	
CF201, 202	RLFKTF2M01LC	ORANGE(10.725MHz)	
CF901	EFOGC4194T4	OSCILLATOR(4.19MHz)	
X101	SVQ49U722-S	OSCILLATOR(7.2MHz)	
		FL DISPLAY(S)	
FL901	RSL0116-F	FL DISPLAY	⚠
		FM FRONT END PACK	
TN101	SNVFE337G01	FM FRONT END PACK	
		FUSE(S)	
F1	XBA2C20TB0	FUSE, 2A 250V	⚠
		SWITCH(ES)	
S601	RSP2008-J	SW, SPEAKERS	
S701	ESD26602A	SW, VOLTAGE ADJ.	(E, EB) ⚠
S901	EVQ21405R	SW, PRESET TUNING 1	
S902	EVQ21405R	SW, PRESET TUNING 2	
S903	EVQ21405R	SW, PRESET TUNING 3	
S904	EVQ21405R	SW, PRESET TUNING 4	
S905	EVQ21405R	SW, PRESET TUNING 5	
S906	EVQ21405R	SW, PRESET TUNING 6	
S907	EVQ21405R	SW, PRESET TUNING 7	
S908	EVQ21405R	SW, PRESET TUNING 8	
S909	EVQ21405R	SW, PRESET TUNING 9	
S910	EVQ21405R	SW, PRESET TUNING 0	
S914	EVQ21405R	SW, POWER	
S916	EVQ21405R	SW, INPUT SELECT, PHONO	
S917	EVQ21405R	SW, INPUT SELECT, TUNER	
S918	EVQ21405R	SW, INPUT SELECT, TAPE	
S921	EVQ21405R	SW, INPUT SELECT, VCR2	
S922	EVQ21405R	SW, INPUT SELECT, VCR1	
S923	EVQ21405R	SW, INPUT SELECT, CD	

Ref. No.	Part No.	Part Name & Description	Remarks
S925	EVQ21405R	SW, LOUDNESS	
S929	EVQ21405R	SW, TUNING(DOWN)	
S930	EVQ21405R	SW, BAND SELECT, FM	
S931	EVQ21405R	SW, BAND SELECT, LW/AM	LW: (E, EB)/AM: (EG)
S932	EVQ21405R	SW, BAND SELECT, MW	(E, EB)
S933	EVQ21405R	SW, FM MODE	
S934	EVQ21405R	SW, MEMORY SCAN	
S935	EVQ21405R	SW, MEMORY	
S936	EVQ21405R	SW, TUNING(UP)	
		RELAY(S)	
RL601	RSY0013-0	RELAY	
RL751	RSY0012-0	RELAY	⚠
		CONNECTOR(S) & SOCKET(S)	
CN651	SJT3213	CONNECTOR(2P)	
CN701	RJS1A1703	CONNECTOR(3P)	
CN702	RJS1A1705	CONNECTOR(5P)	
CN708	RJS1A1703	CONNECTOR(3P)	
CN710	RJS1A1703	CONNECTOR(3P)	
CN751	SJS305-1	CONNECTOR(3P)	
CN901A	RJT003K008-1	CONNECTOR(8P)	
CN901B	RJU003K008M1	SOCKET(8P)	
CN902A	RJT003K008-1	CONNECTOR(8P)	
CN902B	RJU003K008M1	SOCKET(8P)	
CN903A	RJT003K006-1	CONNECTOR(6P)	
CN903B	RJU003K006M1	SOCKET(6P)	
CN904A	RJT003K006-1	CONNECTOR(6P)	
CN904B	RJU003K006M1	SOCKET(6P)	
CN201A	RJT057W007-1	CONNECTOR(7P)	
CN202A	RJT057W007-1	CONNECTOR(7P)	
CN401A	RJS1A1703	CONNECTOR(3P)	
CN501A	RJU003K010M1	SOCKET(10P)	
CN601A	RJS1A1705	CONNECTOR(5P)	
CN908A	SJT30548BB1	CONNECTOR(5P)	
CN201B	RJU057W007	SOCKET(7P)	
CN202B	RJU057W007	SOCKET(7P)	
CN401B	RJS1A1703	CONNECTOR(3P)	
CN501B	RJT003K010-1	CONNECTOR(10P)	
CN601B	RJS1A1705	CONNECTOR(5P)	
CN908B	SJS50581BB	SOCKET(5P)	
		JACK(S) & TERMINAL(S)	
JK101	RJH4202	ANTENNA CONNECT TERMINAL	
JK401	SJF3069N	PHONO, CD TERMINAL	
JK402	SJF3069N	MONITOR TERMINAL	
JK403	SJF3069N	VCR1 TERMINAL	
JK404	SJFD7-5	VIDEO TERMINAL	
JK405	SJFK5-1	VCR2 TERMINAL	

Ref. No.
JK409
JK601
JK602
JK791
HP601
W401
W601
W701

■ RES

Notes :

Ref. No.	
R101	EI
R102	EI
R104	EI
R105	EI
R106	EI
R107	EI
R108	EI
R109-111	EI
R201	EI
R202	EI
R203	EI
R204	EI
R205	EI
R206	EI
R207	EI
R208	EI
R209	EI
R210	EI
R211	EI
R212	EI
R213	EI
R214	EI
R215	EI
R216	EI
R217	EI

Remarks

Ref. No.	Part No.	Values & Remarks
R453, 454	ERDS2TJ224T	1/4W 220K
R455, 456	ERDS2TJ563	1/4W 56K
R457, 458	ERDS2TJ271	1/4W 270
R459, 460	ERDS2TJ680T	1/4W 68
R461, 462	ERDS2TJ184T	1/4W 180K
R463, 464	ERDS2TJ123	1/4W 12K
R465, 466	ERDS2TJ563	1/4W 56K
R467, 468	ERDS2TJ102	1/4W 1K
R471, 472	ERDS2TJ104	1/4W 100K
R473, 474	ERDS2TJ474	1/4W 470K
R475, 476	ERDS2TJ182	1/4W 1.8K
R477, 478	ERDS2TJ392T	1/4W 3.9K
R479, 480	ERDS2TJ223	1/4W 22K
R481, 482	ERDS2TJ332	1/4W 3.3K
R485, 486	ERDS2TJ223	1/4W 22K
R487, 488	ERDS2TJ122	1/4W 1.2K
R489, 490	ERDS2TJ821	1/4W 820
R501, 502	ERDS2TJ104	1/4W 100K
R503, 504	ERDS2TJ102	1/4W 1K
R505-508	ERDS2TJ104	1/4W 100K
R509, 510	ERDS2TJ103	1/4W 10K
R513	ERDS2TJ153	1/4W 15K
R514	ERDS2TJ394	1/4W 390K
R521, 522	ERDS2TJ104	1/4W 100K
R523, 524	ERDS2TJ222	1/4W 2.2K
R525, 526	ERDS2TJ221	1/4W 220
R527-530	ERDS2TJ102	1/4W 1K
R531	ERDS2TJ394	1/4W 390K
R532	ERDS2TJ103	1/4W 10K
R533	ERDS2TJ104	1/4W 100K
R534	ERDS2TJ103	1/4W 10K
R535	ERDS2TJ104	1/4W 100K
R601, 602	ERDS2TJ102	1/4W 1K
R603, 604	ERDS2TJ563	1/4W 56K
R605, 606	ERDS2TJ332	1/4W 3.3K
R607, 608	ERDS2TJ563	1/4W 56K
R609, 610	ERDS2TJ470	1/4W 47
R611, 612	ERDS1FVJ100T	1/2W 10 ⚠
R613	ERDS2TJ223	1/4W 22K
R614	ERD25FJ470	1/4W 47 ⚠
R615	ERDS2TJ473	1/4W 47K ⚠
R616, 617	ERDS1FVJ471T	1/2W 470 ⚠
R619, 620	ERG2SJ331P	2W 330
R623	ERDS2TJ684	1/4W 680K ⚠
R627	ERDS2TJ154	1/4W 150K ⚠
R628	ERDS2TJ684	1/4W 680K
R631	ERDS2TJ103	1/4W 10K
R632	ERD25FJ101	1/4W 100 ⚠
R651-654	ERDS2TJ223	1/4W 22K
R655	ERDS2TJ682T	1/4W 6.8K
R656	ERDS2TJ103	1/4W 10K
R657	ERDS2TJ220T	1/4W 22

Ref. No.	Part No.	Values & Remarks
R658	ERDS2TJ223	1/4W 22K
R659	ERDS2TJ222	1/4W 2.2K
R660	ERDS2TJ103	1/4W 10K
R661	ERDS2TJ333	1/4W 33K
R662	ERDS2TJ104	1/4W 100K
R663	ERDS2TJ153	1/4W 15K
R664, 665	ERDS2TJ103	1/4W 10K
R666	ERDS2TJ333	1/4W 33K
R670	ERDS1FVJ390T	1/2W 39 ⚠
R671, 672	ERDS2TJ471	1/4W 470
R673	ERDS2TJ332	1/4W 3.3K
R687, 688	ERDS2TJ102	1/4W 1K
R689, 690	ERDS2TJ221	1/4W 220
R701	ERDS1FVJ332T	1/2W 3.3K ⚠
R702	ERDS2TJ122	1/4W 1.2K
R703	ERDS2TJ272T	1/4W 2.7K
R704	ERDS2TJ222	1/4W 2.2K
R705	ERDS2TJ272T	1/4W 2.7K ⚠
R706	ERDS2TJ102	1/4W 1K ⚠
R708, 709	ERDS1FVJ180T	1/2W 18 ⚠
R710	ERDS2TJ272T	1/4W 2.7K
R711	ERDS1FJ270	1/2W 27 ⚠
R715	ERDS2TJ103	1/4W 10K ⚠
R716	ERDS2TJ222	1/4W 2.2K
R717	ERD25FVJ150T	1/4W 15 ⚠
R718, 719	ERDS2TJ1R5T	1/4W 1.5 ⚠
R755	ERDS2TJ102	1/4W 1K
R771	ERDS1FVJ2R2T	1/2W 2.2 ⚠
R773	ERDS1FVJ6R8T	1/2W 6.8 ⚠
R777	ERDS1FJ270	1/2W 27 ⚠
R780	ERDS1FVJ4R7T	1/2W 4.7 ⚠
R839, 840	ERDS2TJ153	1/4W 15K
R851	ERDS1FVJ2R2T	1/2W 2.2 ⚠
R891, 892	ERDS2TJ102	1/4W 1K
R893	ERDS2TJ472	1/4W 4.7K
R901	ERDS2TJ102	1/4W 1K
R902	ERDS2TJ681	1/4W 680
R903, 904	ERDS2TJ103	1/4W 10K
R905, 906	ERDS2TJ102	1/4W 1K
R907, 908	ERDS2TJ182	1/4W 1.8K
R909, 910	ERDS2TJ222	1/4W 2.2K
R911, 912	ERDS2TJ392T	1/4W 3.9K
R913, 914	ERDS2TJ562	1/4W 5.6K
R915, 916	ERDS2TJ123	1/4W 12K
R917, 918	ERDS2TJ273	1/4W 27K
R919	ERDS2TJ224T	1/4W 220K
R920	ERDS2TJ222	1/4W 2.2K
R921	ERDS2TJ103	1/4W 10K
R922, 923	ERDS2TJ472	1/4W 4.7K
R924-926	ERDS2TJ104	1/4W 100K
R927	ERDS2TJ181T	1/4W 180
R930, 931	ERD25FJ101	1/4W 100 ⚠

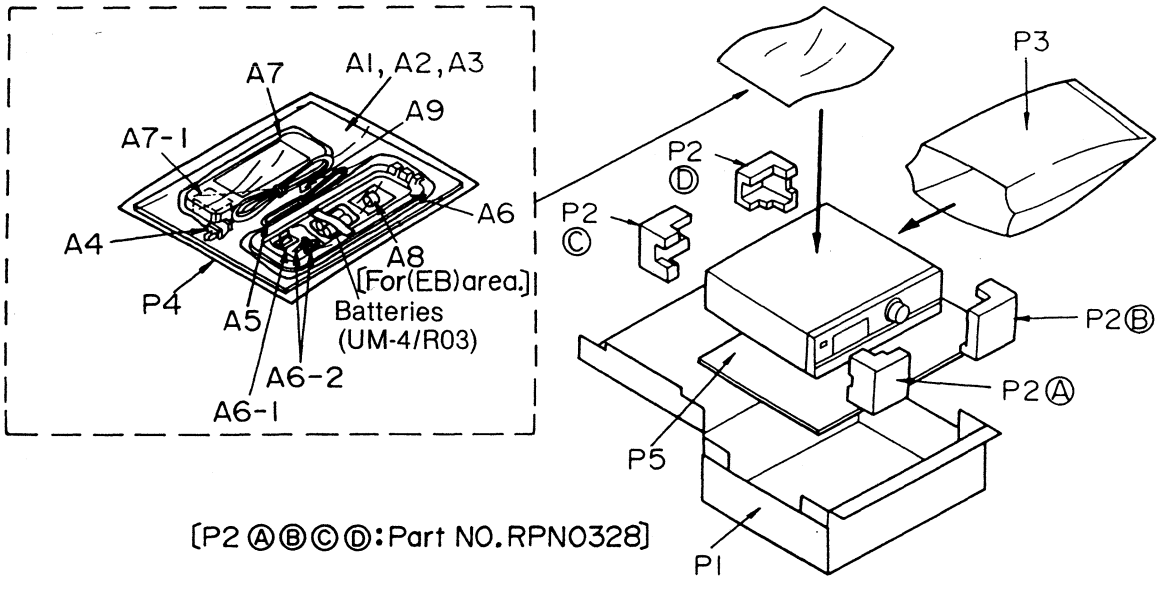
Ref. No.	Part No.	Values & Remarks
R937	ERDS2TJ103	1/4W 10K
R938	ERDS2TJ104	1/4W 100K
R941	ERDS2TJ103	1/4W 10K
R943, 944	ERDS2TJ104	1/4W 100K
R945-947	ERDS2TJ331	1/4W 330
		CAPACITORS
C101, 102	ECBT1H150JC5	50V 15P
C103	ECBT1H102KB5	50V 1000P
C105	ECEA0JU221	6.3V 220U
C106	ECKR1H103ZF5	50V 0.01U
C107	ECKT1H223ZF	50V 0.022U
C108	ECEA1EKA4R7B	25V 4.7U
C109	ECEA1CU330	16V 33U
C110, 111	ECBT1H102KB5	50V 1000P
C201, 202	ECKR1H103ZF5	50V 0.01U
C204	ECBT1H470J5	50V 47P
C205	ECKT1H223ZF	50V 0.022U
C206	ECBT1H150JC5	50V 15P
C207	ECBT1C103MS5	16V 0.01U
C208	ECEA0JU101B	6.3V 100U
C209	ECEA1HKA100B	50V 10U
C210-212	ECKT1H223ZF	50V 0.022U
C213	ECBT1H101KB5	50V 100P
C214	ECEA1CKA100B	16V 10U
C215	ECKR1H103ZF5	50V 0.01U
C216	ECEA1CKA100B	16V 10U
C217	ECEA1HKA010B	50V 1U
C220	ECEA1CKA100B	16V 10U
C221	ECFR1E183KR	25V 0.018U
C222	ECQB1H473KF3	50V 0.047U
C225	ECBT1H180JC5	50V 18P
C226	ECKR1H103ZF5	50V 0.01U
C227	ECEA1CKA100B	16V 10U
C228	ECBT1H8R2KC5	50V 8.2P (E, EB)
C228	ECBT1H100JC5	50V 10P (EG)
C229	ECBT1H102KB5	50V 1000P
C230	ECBT1H471KB5	50V 470P
C251	ECBT1E223ZF	25V 0.022U (E, EB)
C252	ECEA1HKA010B	50V 1U (E, EB)
C253	ECKT1H223ZF	50V 0.022U (E, EB)
C301	ECA1CM101B	16V 100U
C302	ECEA1HKAR47B	50V 0.47U
C303	ECEA1HKA010B	50V 1U
C304-306	ECEA1HKA3R3B	50V 3.3U
C307, 308	ECFR1E392KR	25V 3900P
C309	ECKT1H223ZF	50V 0.022U
C310	ECFR1E473KR	25V 0.047U
C311	ECQP1471JZ	50V 470P
C312	ECEA1EKA4R7B	25V 4.7U
C313, 314	ECBT1H102KB5	50V 1000P

Ref. No.	Part No.	Values & Remarks
C321	ECEA1CKA100B	16V 10U
C323, 324	ECFR1E332KR	25V 3300P
C325	ECBT1H330J5	50V 33P
C326	ECKR1H103ZF5	50V 0.01U
C401, 402	ECBT1E103ZF	25V 0.01U
C404	ECEA1HKA010B	50V 1U
C405, 406	ECBT1H101KB5	50V 100P
C407	ECEA0JU101B	6.3V 100U
C409, 410	ECBT1E103ZF	25V 0.01U
C421, 422	ECEA1CKA220B	16V 22U
C451, 452	ECEA1EKA4R7B	25V 4.7U
C453, 454	ECBT1H101KB5	50V 100P
C455, 456	ECBT1H102KB5	50V 1000P
C457, 458	ECFR1E223KR	25V 0.022U
C459, 460	ECFR1E682KR	25V 6800P
C461, 462	ECEA1EKA4R7B	25V 4.7U
C463, 464	ECEA1AKA330B	10V 33U
C471, 472	ECBT1H150JC5	50V 15P
C473, 474	ECBT1H101KB5	50V 100P
C475, 476	ECBT1H221KB5	50V 220P
C477, 478	ECEA1CKA100B	16V 10U
C479, 480	ECFR1E123KR	25V 0.012U
C481, 482	ECFR1E683KR	25V 0.068U
C483, 484	ECFR1E562KR	25V 5600P
C485, 486	ECFR1E273KR	25V 0.027U
C487, 488	ECBT1E103ZF	25V 0.01U
C489-492	ECEA1CKA100B	16V 10U
C501, 502	ECEA1EKA4R7B	25V 4.7U
C503, 504	ECBT1H101KB5	50V 100P
C505, 506	ECEA1EKA4R7B	25V 4.7U

Ref. No.	Part No.	Values & Remarks
C507, 508	ECBT1E103ZF	25V 0.01U
C509, 510	ECFR1E333KR	25V 0.033U
C519, 520	ECEA1EKA4R7B	25V 4.7U
C521-523	ECBT1E103ZF	25V 0.01U
C601, 602	ECEA1EKA4R7B	25V 4.7U
C603, 604	ECBT1H271KB5	50V 270P
C605, 606	ECEA1CKA220B	16V 22U
C607, 608	ECCD1H150KC	50V 15P
C609, 610	ECBT1H821KB5	50V 820P
C611, 612	ECFR1E223KR	25V 0.022U
C613	ECEA1VU470	35V 47U
C614	ECEA1HU330	50V 33U
C615	ECEA2AU100	100V 10U
C616	ECEA2AN2R2SB	100V 2.2U ⚠
C651	ECEA1HKA2R2B	50V 2.2U
C652	ECEA1CKA100B	16V 10U
C653	ECEA0JU221	6.3V 220U
C654	ECKT1H223ZF	50V 0.022U
C671, 672	ECBT1H180JC5	50V 18P
C673, 674	ECBT1H221KB5	50V 220P
C675, 676	ECBT1H101KB5	50V 100P
C677, 678	ECBT1H331KB5	50V 330P
C679, 680	ECBT1H101KB5	50V 100P
C685, 686	ECBT1H101KB5	50V 100P
C687, 688	ECKR1H103ZF5	50V 0.01U
C689, 690	ECKT1H101KB	50V 100P
C691, 692	ECKR1H103ZF5	50V 0.01U
C693, 694	ECBT1H331KB5	50V 330P (E, EB)
C693, 694	ECKR1H331KB5	50V 330U (EG)
C695, 696	ECBT1H331KB5	50V 330U (E, EB)

Ref. No.	Part No.	Values & Remarks
C697, 698	ECBT1H101KB5	50V 100P
C701, 702	ECES1HV822UM	50V 8200P ⚠
C703	ECKR1H103ZF5	50V 0.01U
C704	ECA1VM101B	35V 100U
C705	ECA1CM101B	16V 100U
C706	ECKR1H103ZF5	50V 0.01U
C709	ECKR1H103ZF5	50V 0.01U ⚠
C710	ECKR1H103ZF5	50V 0.01U
C711	ECA1CM101B	16V 100U
C712	ECEA1VU470	35V 47U
C713	ECEA1AU101	10V 100U
C751	ECA1EM102E	25V 1000U
C752	ECEA1CU470	16V 47U
C753	ECBT1E103ZF	25V 0.01U
C754	ECKR1H103ZF5	50V 0.01U ⚠
C755	ECBT1E103ZF	25V 0.01U
C771	ECQE2104KF3	250V 0.1U ⚠
C791	ECKWNS103ZVS	500V 0.01U ⚠
C851, 852	ECEA0JU101B	6.3V 100U
C853, 854	ECFR1E104KR	25V 0.1U
C891	ECFR1E392KR	25V 3900P
C901	ECEA0JU102	6.3V 1000U
C902	ECBT1E103ZF	25V 0.01U
C904, 905	ECEA0JU102	6.3V 1000U
C906	ECBT1E103ZF	25V 0.01U
C911, 912	ECEA2AU100	100V 10U ⚠
C913	ECEA1HKA100B	50V 10U
C914	ECEA1HKA100B	50V 10U ⚠
C916	ECEA1HKA010B	50V 1U

■ PACKAGING



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